THE RELATIONSHIP BETWEEN OPTIMISM AND MARKERS OF PSYCHOLOGICAL HEALTH IN COLLEGIATE ATHLETES

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A thesis submitted to the faculty at the University of North Carolina at Chapel Hill in partial fulfillment of the requirements for the degree of Masters of Arts in the Department of Exercise and Sport Science (Athletic Training) in the College of Arts & Sciences.

Chapel Hill

2015

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ABSTRACT

Lindsay McCarn Smith: The Relationship between Optimism and Markers of Psychological Health in Collegiate Athletes
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There is a current need to examine collegiate athletes' psychological health. Our study examined the relationship between optimism and psychological health and explored how imagery affects optimism. Division I collegiate varsity and club athletes completed an internet-based questionnaire (including the LOT, SWLS, I-PANAS-SF, and ABQ) as a measurement of psychological health. The experimental group completed an imagery intervention in efforts of altering optimism. Correlational analyses identified associations among optimism and the psychological health outcomes at time one. The repeated measure ANOVA's identified a significant change in optimism in all participants throughout the study but identified no significant change in affect, burnout, and psychological well-being. The study indicated optimism may change. The study did not show clinical implications for using imagery to improve optimism in student-athletes; however it did not indicate any negative effects of providing information about positivity and incorporating imagery into a student-athletes daily life.

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LIST OF ABBREVIATIONS

ABQ	Athlete Burnout Questionnaire
ANOVA	Analysis of Variance
I-PANAS-SF	International Positive Affect and Negative Affect Schedule Short Form
LOT	Life Orientation Test
MIAMS	Motivational Imagery Ability Measure Scale
NCAA	National Collegiate Athletic Association
SWB	Subjective Well-Being
SWLS	Satisfaction with Life Scale

CHAPTER 1

INTRODUCTION

In 2011-2012, according to the National Collegiate Athletic Association, there were more than 450,000 student-athletes participating in collegiate sports (Neal, Diamond, Goldman, Klossner, Morse, Pajak, Putukian, Quandt, Sullivan, Wallack, & Welzant, 2013). Student-athletes' must attend to both their physical and psychological health while participating in sports. A multitude of instances exist when a medical professional must consider the physical capabilities of athletes; for instance, during injury rehabilitation. However, the psychological aspect of a student-athlete's maintenance and treatment should also be considered. Athletic injuries may lead to psychological disturbances, likely resulting from increased psychological stress (Neal et al., 2013). According to Neal et al. these psychological disturbances may include changes in eating/sleeping habits, alcohol use, loss of emotion, mood swings, irritability, negative self-talk, excessive worry, fatigue, and overuse injuries (Neal et al., 2013). Student-athletes' may also experience these psychological disturbances during life transitions, such as beginning or finishing college. Another potential impetus for psychological disturbances is traumatic life events with unclear personal outcomes (Carver, Scheier, & Segerstrom, 2010). For example, a student-athlete might experience psychological changes when a teammate suffers from an accidental death. These psychological disturbances have potential to contribute to changes in individual expression of personality or dispositional traits.

One personality trait which may be affected by psychological changes in an individual is optimism. Optimism is the expectation of good circumstances occurring in the future (Eichner, Kwon, & Marcus, 2014). Optimism can be classified as a state or trait attitude. State optimism changes in relation to the current circumstance or situation (Kluemper, Little, & De Groot, 2009) while trait optimism refers to stable changes generally occurring with optimism (Kluemper et al., 2009). Past researchers have indicated there is a relationship between optimism, physical health (Carver et al., 2010; Lipowski, 2012), mental health (Carver et al., 2010), and overall well-being (Blackwell, Rius-Ottenheim, Schulte-van Maaren, Carlier, Middelkoop, Zitman, Spinhoven, Holmes, & Giltay, 2013; Carver et al., 2010; Conversano, Rotondo, Lensi, Della Vista, Arpone, & Reda, 2010; Lipowski, 2012). Evidence supporting potential individual changes in dispositional optimism has been inconclusive due to the trait and state distinction (Blackwell et al., 2013; Carver et al., 2010; Meevissen, Peters, & Alberts, 2011b). For example, Carver et al. concluded optimism is a relatively stable personality trait that may be manipulated using an intervention, but due to the innate stability of trait optimism, the changes evoked by the intervention may not be significant or clinically relevant. However, past research has used imagery interventions to demonstrate how optimism may change over the course of a study in non-athletic populations (Blackwell et al., 2013; Meevissen et al., 2011b).

Other research studies have demonstrated optimism may be manipulated with imagery by visualizing future events (Blackwell et al., 2013; Meevissen et al., 2011b). A study completed by Blackwell et al. examined how imagining positive and negative events affected optimism levels, in addition to the vividness of the imagery, in Dutch participants ranging from ages 18-65. They found the vividness of the imagery and what the individual imagines to affect changes in optimism. The study indicated when vividly imagining positive events, a person experiences

higher optimism levels; whereas when an individual vividly imagines negative events they possess lower optimism levels (Blackwell et al., 2013). Another study completed by Meevissen et al. studied how using "best possible self" imagery would alter an individual's optimism levels. The Dutch participants, ranging from ages 18-43, imagined their best possible future self and then reflected about it in a journal log (Meevissen et al., 2011b). The researchers found the individuals of the study to experience increases in optimism over the course of the study by using the "best possible self" imagery (Meevissen et al., 2011b). Therefore, these studies indicate vividly imagining positive future events or circumstances could lead to increases in optimism levels in the average population. However, the researchers did not examine an athletic population and how their optimism levels may be affected by imagery. As a result, it is necessary to study whether imagery may produce significant changes in optimism in a student-athlete population.

As clinicians and researchers it is important to recognize that athletes have both physical and psychological needs; therefore, it would be beneficial to identify of how psychological factors, such as optimism, may be related to physical health. In a meta-analysis of optimism and physical health, Rasmussen et al. found optimistic people to report having less pain related symptoms, and better overall physical function (Rasmussen, Scheier, & Greenhouse, 2009). Importantly, past studies have focused on the general population; therefore it would be beneficial to examine athletes' optimism to identify if their optimism level differs from the general public because of the different demands placed on them. For instance, Division I athlete's typically have a greater amount of physical demands, in addition to the cognitive challenges, placed on them when compared to the general public. They have the cognitive demands associated with both their athletics and academics endeavors as well as from general life tasks and related

stressors. As a result of these multi-faceted demands faced by student-athletes, their day-to-day atmosphere differs than that of the general public.

While many research studies have focused on the physical health of athletes, this study will address key markers of the athlete psychological health and specifically examine: 1) how they are associated with optimism and 2) whether they may be influenced by imagery-based optimism training. Psychological health is measured through a variety of psychosocial markers including affect, characterized as either positive or negative. Affect is the extent a person experiences engagement with the environment resulting in a variety of mood states, whether it is pleasant or unpleasant (Crawford & Henry, 2004; Watson, Clark, & Tellegen, 1988), and can therefore be classified as either positive or negative. Positive affect is associated with positive emotions such as pride, love, and happiness (Lazarus, 1991, 1993), whereas negative affect is linked to maladaptive psychological responses such as depression and anxiety (Crawford & Henry, 2004). In an athletic population, positive and negative affect levels can alter how an individual perceives and physically adapts to a sport. For instance, an individual with elevated positive affect may have increased motivation to work harder at practice in an effort to improve performance compared to someone with low positive affect levels. An athlete with high negative affect may have increased feelings of anxiety causing them to move their focus from competing well to worrying about not being successful compared to those with low negative affect (Wilson, J.S., & Pritchard, 2002). In addition, a study completed by DeFreese and Smith has shown significant a positive correlation between trait negative affect and burnout (DeFreese & Smith, 2014). In addition, they identified significant negative correlations between negative affect and trait optimism and psychological well-being (DeFreese & Smith, 2014). Thus, research indicates affect is associated with important markers of psychological health.

Another psychological health outcome of optimism and psychological health is athlete burnout which Raedeke defined as a cognitive affective syndrome encompassing several symptoms including: emotional and physical exhaustion; reduced sense of accomplishment; and sport devaluation (Raedeke, 1997). Student-athletes experience several different types of psychological variables including situational demands, cognitive appraisal, physiological demands, and coping/task behavior (Gould, Udry, Tuffey, & Loehr, 1996). Gould et al. suggested low social support, chronic stress, injuries, anxiety, tension, psychological withdrawal, and lower school performance are some components that may contribute to burnout in athletes (Gould et al., 1996). Thus, athlete burnout may negatively contribute to several factors in a student-athlete's life, including athletic performances, academic engagements, and psychological health outcomes (Gould, 2002). Identifying an intervention addressing psychological health outcomes, such as athlete burnout, psychological well-being, affect, and optimism, will provide additional insight for how a student-athlete's psychological health may be altered.

Past research studies have shown mental imagery as a useful tool for increasing optimism levels (Meevissen et al., 2011b) and psychological well-being (Blackwell et al., 2013). Imagery is a mental process that includes generating positive thoughts, controlling those thoughts, and vividly imagining positive future events (Blackwell et al., 2013; Meevissen et al., 2011b). Research studies have used imagery to focus on future events and the perception of those events. For instance, Meevissen et al completed a study that required the participants to imagine their "best possible self" to increase levels of optimism (Meevissen et al., 2011b). In this study, participants were asked to write down all aspects their future best possible self should encompass (personal domain, relational domain, and professional domain) (Meevissen et al., 2011b). They were then asked to use imagery daily to recreate that situation mentally for the subsequent two

weeks, which resulted in a significant increase in optimism. Blackwell et al. completed another study examining the relationship between optimism and imagery relationship and examined how the vividness of imagining positive and negative events related to an individual's optimism levels (Blackwell et al., 2013). They concluded effectiveness in vividly creating images could lead to higher levels of optimism (Blackwell et al., 2013). They found higher vividness of positive events to relate to higher optimism scores and higher vividness of negative events to associate with lower optimism scores (Blackwell et al., 2013). This study identifies the importance of focusing on positive events when completing an imagery task in order to positively affect an individual's optimism levels. However, both of these studies did not assess the effects of imagery on dispositional optimism and/or psychological health outcomes in athlete populations.

Imagery has been used specifically in athletic populations for performance and motivational purposes throughout practice and competition (Blair, Hall, & Leyshon, 2007; Munroe-Chandler, Hall, Fishburne, & Strachan, 2007). In these studies, athletes have found imagery to be beneficial by helping them effectively mentally re-create competitive situations and appropriate corresponding responses (Blair et al., 2007; Munroe-Chandler et al., 2007). However, these research studies have not focused on the benefits of imagery relative to athlete psychological health outcomes (i.e. psychological well-being, positive affect, negative affect, athlete burnout) or optimism. Therefore, it would be clinically beneficial to study collegiate athlete optimism and the effects of imagery to identify potential clinical psychological treatments for this population.

In the 2013 position statement "Inter-Association Recommendations for Developing a Plan to Recognize and Refer Student-Athletes With Psychological Concerns at the Collegiate

Level: An Executive Summary of a Consensus Statement," the National Athletic Trainers' Association emphasized the current need and importance of examining and intervening to promote the psychological health of collegiate athletes (Neal et al., 2013). One component of psychological health that would be beneficial to examine empirically is trait optimism. Specifically, it may be possible to manipulate trait optimism by using an intervention. An intervention targeting trait optimism would be beneficial for increasing a student-athlete's positive outcomes of psychological health. An intervention is a method of action used to cause a change in an individual, such as a psychological trait like optimism. In order to ensure the effectiveness of the intervention, studies should focus on a healthy population prior to injured collegiate athletes. By observing healthy athletes, the researchers will grasp an understanding of athlete's ability to complete an imagery task successfully. As we learn more about an athlete's ability to complete imagery and how it affects athlete's psychological health outcomes and optimism, we may identify a need for further application of an imagery intervention to examine how it relates to injury and rehabilitation.

Our current study allowed us to evaluate athlete behavioral responses to an imagery-based psychological intervention and the efficacy of using this intervention in a clinical setting, which to our knowledge has not been studied previously. The primary purpose of this study was to examine the relationships between optimism and markers of athlete psychological health (including psychological well-being, positive affect, negative affect, and athlete burnout). Our secondary purpose was to explore if and to what degree collegiate athlete optimism can be manipulated with a motivational imagery intervention. The final purpose was to identify how markers of psychological health were affected in collegiate athletes after a nine week

motivational imagery intervention. Our participants consisted of Division I varsity and club sport student-athletes.

Research Questions

RQ1: How is collegiate athlete baseline trait optimism associated with positive affect, negative affect, athlete burnout, and psychological well-being?

Hypothesis 1: Collegiate athlete baseline trait optimism was hypothesized to positively correlate with psychological well-being and positive affect and negatively correlated with negative affect and burnout.

RQ2: Does a nine week motivational imagery intervention increase healthy collegiate athlete's trait optimism scores from baseline as compared to controls?

Hypothesis 2: Healthy collegiate athletes who receive the motivational imagery intervention will exhibit increases in trait optimism from baseline compared to controls.

RQ3: How does a nine week motivational imagery intervention affect psychological well-being, positive affect, negative affect, and athlete burnout in healthy collegiate athletes?

Hypothesis 3A: Athletes exposed to the motivational imagery intervention will exhibit higher levels in psychological well-being as compared to controls.

Hypothesis 3B: Athletes exposed to the motivational imagery intervention will exhibit higher levels in positive affect as compared to controls.

Hypothesis 3C: Athletes exposed to the motivational imagery intervention will exhibit no change (i.e. lack of an increase) in negative affect as compared to controls.

Hypothesis 3D: Athletes exposed to the motivational imagery intervention will exhibit no change (i.e. lack of an increase) burnout as compared to controls.

CHAPTER 2

LITERATURE REVIEW

Optimism

This research study examined the relationships among athlete perceptions of optimism, psychological well-being, positive affect, negative affect, and burnout. In a literature review completed by Carver et al., optimism was defined as a personality trait that reflects the extent an individual has favorable expectancies of their future (Carver et al., 2010). In this review, the authors suggested optimism is a relatively stable trait, but may be subject to change during times of life transition, breaks from prior experiences, and when the outcome is uncertain, such (i.e. personal response to traumatic events like a death in the family) (Carver et al., 2010). Kluemper and DeGroot suggested optimism can be classified as a trait or a state depending on the circumstance (Kluemper et al., 2009). Trait optimism is related to general outcomes (e.g. long term health) and represents more individual differences in the level of optimism (Kluemper et al., 2009). State optimism may be changed due to situational or contextual factors and has been shown to relate more to occupational outcomes, which may be due to the variation of leadership styles of employers (Kluemper et al., 2009). Student-athletes are subjected to a variety of transition periods throughout their collegiate career (i.e. beginning college, in-season, post-season, academic semesters), therefore it would be beneficial to observe how their trait optimism may change. The current study focused on trait optimism in order to identify the long-term

changes that may occur with a psychological imagery intervention in a collegiate student-athlete population.

In addition to the examining optimism based on classification (trait vs. state), optimism research has largely been informed by two theories. The explanatory style theory (Buchanan & Seligman, 1995) and self-regulatory theory (Carver & Scheier, 1981) were each developed to portray a better conceptual understanding of optimism. The explanatory style theory suggests an individual rationalizes the causes of both negative and positive events to explain why these events occurred (Buchanan & Seligman, 1995). This theory categorizes optimistic people as those who associate bad events to external, unstable reasons and good events to personal, internal reasons (Kluemper et al., 2009). This implies optimistic individuals will take credit for the positive events that occur in their life. The explanatory theory helps identify how people may rationalize events occurring in their life as well as their subsequent reactions to them (Buchanan & Seligman, 1995). For example, an optimistic person may rationalize a car accident as an incident out of their control, but recognize that passing their exam occurred from studying. Therefore, the explanatory theory focuses on the explanation or rational for events.

Alternatively, the Self-Regulatory Nature Theory focuses on human behavior in relation to goals (Carver & Scheier, 1981). This theory suggests that when a person realizes there is a conflict between their personal goal and the current situation; the person will re-assess the situation (Carver & Scheier, 1981). Moreover, when a person encounters a situation with a particular goal, then he/she will determine if the present goal is worth the mental effort required to attain that goal (Kluemper et al., 2009). This theory relates more to a person's overall goals and how goals adapt as the individual changes. For instance, a track athlete may have a goal to improve their nutrition by eating more fruit and sleep at least eight hours a night in order to

perform better physically and mentally. In relation to optimism, the self-regulatory nature theory suggests when people, such as student-athletes, attain their goals; they will experience high levels of optimism.

Both theories attempt to explain how a person's psychological perspective may affect their overall optimism. The explanatory theory emphasizes how the student-athlete rationalizes why the event occurred (i.e. poor performance at a meet), whereas the self-regulatory theory suggests why the student-athlete may change their overall goals in certain circumstances (i.e. perform well enough to go to an advanced round of competition such as Regionals). In addition, the explanatory theory and self-regulatory theory provide additional methods for explaining an athlete's level of optimism. These theories provide insight on how components of an athlete's psychology, including optimism, may change situational optimism responses and vice versa. If a student-athlete can positively rationalize through certain events occurring, whether they are good or bad, then it may lead to changes in optimism. Also, if a student-athlete is able to achieve the goals they set for themselves, then they may feel more positive emotions, such as optimism, due to their ability to complete the task successfully.

Research has indicated there are several positive benefits to optimism associated with individual outcomes of psychological well-being and one's ability to effectively cope with stressors. Optimism has been shown to increase the overall well-being of an individual (Aspinwall & Taylor, 1992; Meevissen et al., 2011b). In addition, optimism has been associated with certain coping skills. Studies have shown optimists typically have engagement coping skills, problem focused coping, and proactive coping (Gustafsson & Skoog, 2012; Meevissen et al., 2011b; Schou, Ekeberg, & Ruland, 2005). Engagement coping focuses on dealing directly with the stressor or one's emotions (Compas, Connor-Smith, H., Thomsen, & Wadsworth, 2001).

Problem focused coping is aimed to alter the stressor itself to decrease the amount of distress occurring (Lazarus & Folkman, 1984). Proactive coping is defined as actively trying to prevent an event from occurring (Aspinwall & Taylor, 1997). These coping skills directly target the stressor and should help the individual adaptively adjust to the situation presented to them. If an individual may more effectively adapt to the stressors placed on them through coping mechanisms then they may have better outcomes of psychological health and optimism.

Optimism levels may vary amongst different populations, including the general public and student-athletes. A couple of studies examined how optimism levels differ between athletes and non-athletes. Lipowski conducted a research study suggesting athletes possess higher levels of optimism than non-athletes (Lipowski, 2012). Lipowski compared athletes (competing in team and individual sports) and non-athletes, between the ages of 16-30, to evaluate variations in optimism levels (Lipowski, 2012). Lipowski concluded athletes, both female and male, displayed a higher degree of optimism when compared to non-athletes (Lipowski, 2012).

Another study conducted by Venne et. al examined the differences in optimism between non-athletes and athletes, in addition to the individuals level of competition for the athletes (first verses final season) and academic year (first year verses final year). Venne et al. studied athletes of various Division I athletic sports including: women's basketball, women's volleyball, men's tennis, baseball, football, softball, hockey, cheerleading, swimming, and water polo. The non-athletes in this study were not currently participating in athletics, had not participated in athletics in high school, and were psychology students. Venne et al. found athletes and non-athletes in their final year of school to exhibit higher levels of optimism as compared to first year athletes and non-athletes (Venne, Laguna, Walk, & Ravizza, 2011). In addition, they found significant differences in optimism scores of final year athletes and first year athletes indicating that final

year athletes possessed higher optimism levels (Venne et al., 2011). Therefore, an athlete's optimism level may vary depending on their collegiate experience with their sport. This is a valuable element when studying collegiate athletes of all years because they may experience different levels of optimism at the beginning of the study. If a final year athlete participates in a study focusing on improving or changing optimism, they may not experience significant changes in optimism since they may already possess high levels of optimism. Whereas, a first year athlete may experience significant changes in optimism through the use of an intervention since they begin with lower optimism levels as compared to a final year athlete.

Optimism has also been examined as it may be associated with athlete psychological responses to injury. A study completed by Madrigal and Gill examined how Division I collegiate female athletes respond psychologically as a result to an injury (Madrigal & Gill, 2014). This study examined several psychological factors including mental toughness, optimism, and stressors. They completed case studies on four female collegiate athletes who played soccer or softball. The results of the study indicated variations in the psychological reactions of the female athletes. Some of the athletes experienced decreases in optimism levels initially following injury and during the beginning of rehabilitation, however they returned to normal by the time they were cleared to play (Madrigal & Gill, 2014). In addition, the study indicated the athletes felt additional stressors from the coaches and feelings that they were letting the team down while they were injured. The support of teammates, friends, coaches, and athletic trainers helped one athlete better cope with her injury and understand it better. Therefore, additional support from the athletic trainers and identifying ways to incorporate psychological treatment for athletes, while incorporating dispositional optimism, may help promote athlete psychological health in a

variety of athlete populations, including those athletes currently ongoing rehabilitation from an injury.

Research shows individuals with higher positivity and life optimism have the potential to have less reported and presented physical symptoms of illness and injury (Scheier & Carver, 1985). As a student-athlete, injury and illness prevention are pertinent due to the increased physical and psychological pressures they experience daily with their sport and daily activities (i.e. academics). A study performed by Hanssen et al. examining how the utilization of a "best possible self" imagery strategy may affect pain. This study found subjects to report less pain symptoms with cold immersion as compared to control participants (Hanssen, Peters, Vlaeyen, Meevissen, & Vancleef, 2013). Also, research has shown optimism is negatively correlated to burnout, which are both factors salient to athlete psychological health and well-being (Gustafsson & Skoog, 2012). Due to the length of seasons and demands of collegiate athlete's sport it is vital that athletes do not become consumed with stress and burnout because they will not be able to perform as well in their sport.

Compared to optimists, pessimists, a distinct but negatively related psychological outcome, perceive stress differently. Pessimism is the expectation of experiencing negative future outcomes (Gustafsson & Skoog, 2012). Pessimists tend to use more avoidance coping, whereas optimists tend to have more active coping (Aspinwall & Taylor, 1992). When actively coping with a situation the individual will recognize the situation and cope accordingly. However, when a person uses avoidance coping, he/she will avoid the conflicting situation. Therefore, the coping style determines if a person reacts positively or negatively to a stressful situation.

In an athletic population, coping could affect how the athletes perform in competition settings. Pessimists and optimists tend to have different interpretations of stress such that optimists tend to experience less negative emotions and view life more positively (Carver et al., 2010). For example, during competition a pessimist may have greater performance anxiety compared to an optimist.

Track and field collegiate athletes optimism in relation to competition anxiety was investigated by Wilson (Wilson et al., 2002). Their group examined how anxiety affects a pessimist's ability to compete athletically. In this study, optimistic individuals possessed lower predicted and actual precompetition anxiety when compared to pessimists (Wilson et al., 2002). Thus, optimistic athletes' have lower levels of anxiety prior to competition compared to pessimists, which could affect their overall well-being. Therefore, this study emphasizes the importance of treating an athlete's psychological health in addition to their physical health because it can not only affect his/her overall well-being, but may also have positive implications for his/her individual performance.

PSYCHOLOGICAL HEALTH FACTORS

Psychological Well-Being

Diener suggested subjective well-being (SWB) consists of three major components: life satisfaction, negative experiences, and positive experiences (Diener, 1984). Several studies have found alterations in a person's SWB may lead to changes in the person's psychological and physical health (Diener & Chan, 2011; Lyubomirsky, King, & E., 2005). Furthermore, these studies suggest people with higher SWB have better health and increased longevity with higher SWB. In addition, Diener suggested that positive feelings can result in more desirable

physiological effects and negative feelings can have undesirable physiological effects, such as increases in stress (Diener, 2013).

Research also examines social support as a factor impacting well-being (Brannan, Biswas-Diener, Mohr, Mortazavi, & Stein, 2013; DeFreese & Smith, 2013; DeFreese & Smith, 2014). Some studies have concluded social support may increase optimal psychological well-being resulting in positive academic outcomes (Brannan et al., 2013; Diener, 1984). Brannan et al. focused on how friends and family are main sources of social support. However, collegiate athletes may also receive social support from their teammates and coaches. Another study completed by DeFreese and Smith identified how social support and negative social interactions related to psychological well-being in Division I and NAIA collegiate athletes. They found social support to positively relate to well-being, whereas negative social interactions negatively correlated to well-being (DeFreese & Smith, 2014). Thus, suggesting positive interactions with others will result in increases in psychological well-being.

Amorose et al. completed a research study discussing psychological well-being in relation to self-esteem and burnout (Amorose, Anderson-Butcher, & Cooper, 2009). In this study, ninety-three adolescent volleyball players were tested to see if perceived competence, autonomy, and relatedness over a competitive season were predictive of changes in athletes well-being, self-esteem, and burnout levels in sport (Amorose et al., 2009). Self-esteem "reflects ones affect toward an overall evaluation of worth or value as a person (Amorose et al., 2009)." In addition, Amorose et al. studied how need satisfaction in sports were linked to specific markers of well-being, such as competence and autonomy (Amorose et al., 2009). They found changes in perceptions of competence and autonomy over the course of a volleyball season were positively related to changes in athlete self-esteem. The researchers also concluded changes in perceptions

of competence, autonomy, and relatedness, which are the need for a sense of belonging, over the course of the season negatively related to changes in athlete's burnout. Therefore, these components of well-being are related to both self-esteem and burnout in student-athletes.

Ford et al. also completed a study that further emphasized the relationship between global self-esteem and psychological well-being (Ford, Eklund, & Gordon, 2000). They investigated how stress may influence an athlete's risk of developing or suffering from an injury (Ford et al., 2000). The study identified how a psychological or physical stress could lead to an injury, which could affect a student-athlete's overall well-being. Ford et al. concluded higher-stress results in more injuries than lower stress (Ford et al., 2000). This study suggests if athletes' decrease their stress levels and keep them to a minimum, they could prevent further injuries from occurring. Therefore, positive psychological well-being could result in decreases in psychological stress and further help prevent injuries from occurring in student-athletes, which would have positive effects physical and psychologically for the individual.

Affect

Affect is another marker of psychological health. Crawford and Henry have shown affect can be classified as either positive or negative (Crawford & Henry, 2004). They further suggest positive affect relates to a pleasurable emotion and negative affect relates to an unpleasant emotion (Crawford & Henry, 2004). In addition, they concluded affect is also associated with how a person engages with their environment resulting in a variety of mood states (Crawford & Henry, 2004).

Positive affect has been linked to positive emotions. Research has shown several terms may be used to describe positive affect, including: enthusiasm, alertness, attentive, interested, excited, inspired, proud, determined, strong, hope and active (Crawford & Henry, 2004; Gustafsson, Skoog, Podlog, & C., 2013) . Gustafsson et al. specifically researches the links between hope and positive affect (Gustafsson et al., 2013). Student's with high hope perform better academically, and experience increases well-being and positive affect (Gustafsson et al., 2013).

Such research has important implications for collegiate athletes since they are obligated to perform well academically and athletically. According to the NCAA, in order to maintain eligibility a Division I athlete must complete at least forty percent of their coursework for their degree by the end of their second year, sixty percent by the end of their third year, and eighty percent by the end of their fourth year (NCAA). In addition, Division I athletes must obtain at least six credit hours each term and meet the GPA requirement established by the school (NCAA). If student-athletes are unable to maintain appropriate academic levels, they are not able to participate athletically, which could negatively affect their psychological health.

Negative affect has been related to negative emotions. Crawford and Henry listed the following terms to describe negative affect: distressed, angry, fearful, guilty, and jittery (Crawford & Henry, 2004). These terms are related to sadness and anger, which would be disadvantageous for the athlete. Negative affect has also been associated with individual perceptions of psychological stress (Gustafsson et al., 2013; Nicholls, Backhouse, Polman, & J., 2009). An athlete, who is no longer allowed to practice and compete due to insufficient grades, would most likely experience an increase in negativity. Consequently, the athlete could have decreases in optimism, psychological well-being, and negative affect.

From a research vantage, Gustafsson et al. found athlete endorsement of perceived stress and negative affect were positively correlated with all three athlete burnout dimensions, including sport devaluation, reduced sense of accomplishment, and emotional and physical exhaustion (Gustafsson et al., 2013). In addition, a study completed by DeFreese and Smith found negative affect to be associated to athlete burnout in Division I and NAIA collegiate athletes (DeFreese & Smith, 2014). Another study completed by Lemyre et al. examined affect and burnout over the course of the season in NCAA Division I swim athletes. They found negative affect to positively related to all three burnout dimensions at the end of the swim season (Lemyre, Treasure, & Roberts, 2006). In addition, they studied if negative affect and positive affect may predict athlete burnout. They identified negative affect may be a predictive factor for athlete burnout, however positive affect was not a significant predictive factor. Thus, research suggests if an athlete exhibits signs of negative affect, they may have an increased risk of experiencing burnout symptoms.

Affect may alter optimism different ways depending on whether it is positive or negative affect. Positive affect is related to positive emotions and engagement with environment, whereas negative affect is related to negative emotions and disengagement with the environment (Crawford & Henry, 2004). Studies have indicated the negative markers of psychological health to positively correlate (i.e. negative affect and athlete burnout) (DeFreese & Smith, 2014; Lemyre et al., 2006) and negatively correlate with positive markers of psychological health (i.e. psychological well-being, optimism, and positive affect) (DeFreese & Smith, 2014). Whereas, studies have shown the positive markers of psychological health to positively correlate (i.e. optimism, psychological well-being, and positive affect) (Gustafsson et al., 2013). Optimism has

been shown to relate to positive emotions, like positive affect, and favorable expectancies of the future.

Athlete Burnout

Another factor that may affect an athlete's psychological health and performance in sport is burnout (Raedeke & Smith, 2004). Athletic burnout consists of: "emotional and physical exhaustion from physiological and psychological demands of competing; reduced sense of personal accomplishment in sports abilities and achievements; and negative detached attitudes towards sport and their involvement in it (Chunxiao, Wang, Pyun, & Kee, 2013; Raedeke, 1997; Raedeke & Smith, 2004)."

Athlete burnout may cause psychological disturbances resulting from the increased athletic demands or challenges (Chunxiao et al., 2013; Raedeke & Smith, 2004). In addition, athletes who have experienced a lack of improvement, success, and/or talent in their sports may have increased risk of developing burnout (Raedeke & Smith, 2001a), possibly due to the lack of personal accomplishment. As a result, when the athlete experiences these negative experiences in sport he/she may stop participating in the sport (Raedeke & Smith, 2004), but not all discontinue participating in their sport.

Another study conducted by Chen et al. researched the relationship between athlete's optimism and burnout (Chen, Kee, & Tsai, 2008). This study examined volleyball athlete's optimism and burnout over the course of four months. Chen et al. found a negative correlation between optimism and burnout, in addition to emotional exhaustion and reduced sense of accomplishment, which are components of burnout (Chen et al., 2008). They suggested an

athlete with more optimism may possess less emotional exhaustion and interpret their sports experience more positively (Chen et al., 2008).

Cresswell and Eklund studied professional rugby player burnout levels relative to motivation (Cresswell, S. L. & Eklund, R. C., 2005). This study demonstrated a correlation between burnout and motivation levels in athletes. Amotivation, which is the lack of motivation, has been positively associated with burnout (Cresswell, S. L. & Eklund, R. C., 2005). Therefore, in athletes, lower intrinsic motivation is associated with higher burnout rates, specifically with sense of accomplishment and sport devaluation (Cresswell, S. L. & Eklund, R. C., 2005). In addition, their follow up study examined rugby players at a top amateur level confirming their previous results (Cresswell, S. L. & Eklund, R.C., 2005). Thus, motivation has been shown to be an important factor that is negatively associated with athlete burnout.

Other factors shown to be correlated to burnout are social support, coping behaviors and perceived stress (DeFreese & Smith, 2013; Gustafsson & Skoog, 2012; Raedeke & Smith, 2004). Social support has been associated with two components of burnout, sense of accomplishment and sport devaluation. Social support has been identified as the presence of other athletes who an individual may rely on and know care for him/her (Raedeke & Smith, 2004). DeFreese and Smith found social support from teammates to be negatively associated with a reduced sense of accomplishment and devaluation (DeFreese & Smith, 2013).

In addition, athlete stress has been found to be positively associated with athlete burnout. Psychological stress is when an environmental event exceeds a person's ability to adapt to the situation and may result in psychological and biological changes (Cohen, Kessler, & Underwood-Gordon, 1997)." Research shows athletes perception of stress is positively

associated with higher self-report burnout levels (Gustafsson, Kenttä, & Hassmén, 2011). Stress can lead to psychological and physical changes, such as anxiety and increased blood pressure (Gustafsson et al., 2011), which may also contribute to emotional and physical exhaustion, which is one of the key facets of burnout.

Researchers have tested two hypotheses to indicate the relationship between social support, coping behaviors, stress, and burnout. One hypothesis suggests social support and coping behaviors negatively and directly influence stressed induced burnout (Raedeke & Smith, 2004). Another hypothesis suggests social support and coping behaviors act as moderators between stress and burnout-related perceptions (Raedeke & Smith, 2004). This study demonstrated stress to act as a more of a direct mediator for burnout, as compared to a moderator (Raedeke & Smith, 2004). In other words, positive, consistent social support and personal coping behaviors help decrease stress and prevent burnout from occurring.

Gustafsson et. al discusses the development of an integrated model to represent and gain an understanding about burnout. In this model, Gustafsson et al. suggests a model representing burnout consists of several factors that lead to development of athlete burnout and lead to its occurrence, such as excessive training, school demands, negative performance, lack of control, diminishing motivation, mood disturbance, lack of coping skills, goal orientation, and trait anxiety (Gustafsson et al., 2011). This model suggests there are several elements effecting overall well-being of an individual when suffering from burnout. Gustafsson et al. describes negative consequences that may occur with burnout, such as mood changes, decreased motivation, and psychological withdrawal (Gustafsson, Kenttä, & Johansson, 2008). As a result, if an individual experiences these changes with burnout, it could be detrimental to their

psychological well-being. Therefore, based on past literature and this current model, we chose to look at burnout in relation to optimism and other psychological health outcomes.

IMAGERY

Imagery is the act of cognitively visualizing an object, situation or sensation as though it were actually occurring in reality (Driediger, Hall, & Callow, 2006). Past studies have suggested effective imagery use may incorporate five senses: vision, audition, olfaction, gustation (taste), and kinesthetic (Vines, 1988). Driediger and Callow indicated the use of imagery evokes the physical characteristics of an absent object, event, or activity that has been perceived in the past or may take place in the future (Driediger et al., 2006).

Imagery has been used for a variety of reasons and in an assortment of populations. Research studies have used imagery to identify psychological and performance changes in non-athletic and (Blackwell et al., 2013; Meevissen et al., 2011b) athletic populations (Blair et al., 2007; Driediger et al., 2006; Munroe-Chandler, Hall, & Fishburne, 2008; Munroe-Chandler et al., 2007). Meevissen et al. asked non-athletic participants to imagine their "best possible self (Meevissen et al., 2011b)." For two weeks, the participants completed a five minute "best possible self" imagery intervention daily followed by a journal entry (Meevissen et al., 2011b). The researchers concluded imagery is beneficial for increasing levels of optimism in non-athletic populations using the Life Orientation Test (LOT) (Meevissen et al., 2011b).

In addition, the vividness of imagery has been used to increase optimism levels in non-athletic populations (Blackwell et al., 2013). This study used the Life Orientation Test-Revised (LOT-R) to identify optimism levels, the Prospective Imagery Test to identify vividness of imagery and the Spontaneous Use of Imagery Scale to identify the frequency of imagery use

(Blackwell et al., 2013). As a result, higher results on the Prospective Imagery Test resulted in higher scores on the LOT, suggesting a positive link between optimism and vividness of imagery use (Blackwell et al., 2013).

Imagery has also been shown to positively influence injury rehabilitation, performance levels, self-confidence and self-efficacy in athletic populations. Paivio developed a theory of cognitive and motivational purposes for imagery that has been supported by several studies (Driediger et al., 2006; Gregg, Hall, & McGowan, 2011; Munroe-Chandler et al., 2008; Paivio, 1985). Specifically, Paivio stated athletes use imagery for five mains reasons: cognitive specific, cognitive general, motivational specific, motivational general arousal, and motivational general mastery (Paivio, 1985). Cognitive specific imagery refers to mental rehearsal of specific skills. Cognitive general imagery addresses the rehearsal of various strategies and plans pertaining to sport. With motivational specific imagery, the individual imagines goals associated with sport participation. Motivational general arousal imagery addresses how imagery relates to arousal, stress, and anxiety of performing. Motivational general mastery imagery refers to constructing images related to being confident and mentally tough.

Munroe-Chandler et al. found motivational general mastery imagery to be positively related to self-confidence and self-efficacy in youth soccer players (Munroe-Chandler et al., 2008). In addition, motivational general mastery imagery use in recreational athletes explained a greater amount of variance in self-confidence than in competitive athletes (Munroe-Chandler et al., 2008). Overall, research indicates imagery has been beneficial for both varsity and recreational athletes. However, future research should examine how motivational general arousal and motivational general mastery imagery interventions alter collegiate athletes' psychological health as evidence shows imagery has caused positive changes in self-confidence

and self-efficacy in the general population. By identifying if an imagery intervention is beneficial, research will gain a better understanding of how to promote positive outcomes athletes psychological health and well-being. In addition to imagery providing psychological benefits for student-athletes, research has demonstrated athletes to have positive performance outcomes resulting from imagery.

Research has examined how athletes use visual (internal and external) and kinaesthetic imagery for sports performance during training, competition, and sport injury rehabilitation (Blair et al., 2007; Driediger et al., 2006; Munroe-Chandler et al., 2007). Training and athletic competition address how imagery has been used to focus on sports performance from a practice and competitive point of view. Training is when an athlete practices and tries to improve their sports specific skills. An athletic competition is an event in which an athlete competes against another individual or team. In addition, imagery may also enhance sports performance from a health related and recovery aspect with sports injury rehabilitation and injury prevention. Sport injury rehabilitation occurs when an athlete completes a rehabilitation plan focusing on injury prevention or rehabilitation of an injury focusing on range of motion, strength, and neuromuscular control. Injury prevention emphasizes correcting biomechanical abnormalities and managing current physical health. Wiese-Bijornstal found imagery was beneficial to athletes during injury recovery due to improved rehabilitation adherence and efficacy (Wiese-Bjornstal, 2010). Also, research studies have investigated what athletes visualize during each imagery session and the timing of these sessions (Blair et al., 2007; Driediger et al., 2006; Munroe-Chandler et al., 2007). Munroe-Chandler et al. found athletes use imagery to imagine themselves succeeding in an event prior to a competition setting (Munroe-Chandler et al., 2007). Beyond, what it is used for, research has examined athletes' attitudes toward imagery use (Blair et al.,

2007). This study extended over a six week soccer training period and found the participants regarded the imagery intervention as helpful and indicated that they would use it in the future (Blair et al., 2007). To date, empirical studies of imagery have largely focused on sport performance enhancement for athletes. To extend the knowledge on imagery use in sport, our study focused on improving athletes' general psychological health and optimism levels, an area in need of future research.

There are several benefits for using imagery as a psychological health intervention. Imagery is a low-cost intervention because it does not require expensive materials or tools. Imagery does not require a large amount of effort. In addition, the individual is only required to imagine a certain emotion or visualize an event for a short period. Imagery is a low-risk intervention and the individuals aren't required to have any laboratory devices attached to them during the intervention. Also, imagery interventions require minimal time to learn and implement appropriately. However, imagery interventions require multiple sessions to result in changes in psychological health, therefore, individuals should complete the task daily for short periods of time to develop changes (Van Raalte & Brewer, 2014).

JOURNAL ENTRIES

Journaling has been used to illustrate what people experience during imagery sessions. Gregg and McGowan found imagery may cause people to experience positive changes in vividness, visualization, kinesthetic and emotional responses, and ease in conjuring the image (Gregg et al., 2011). Due to the variations that may occur with imagery, we asked participants complete the Motivational Imagery Ability Measure Scale (MIAMS) in addition to the journal

entries to identify their ability to complete the imagery task effectively. Therefore, we were able to explore the variability that may occur between the participants' imagery ability.

Journaling has been found to be useful when using an imagery intervention and trying to boost adherence to the study (Blair et al., 2007; Gregg et al., 2011; Meevissen et al., 2011b; Shambrook & Bull, 1996). Specifically, Blair et al. used journaling to identify how often subjects were completing the prescribed imagery task. Their study showed that subjects chose to use imagery outside of the required training sessions suggesting the participants found the intervention helpful. In addition, a study completed by Shambrook and Bull used journal entries to encourage their participants to complete the imagery tasks and adhere to the study. Building on previous study findings: it is important in the current work that participants keep a journal to identify 1) what they imagine and 2) any potential emotional differences the participants recognize following imagery use. Such information is important as a means to recognize the benefits of the imagery intervention by the participants.

Daily imagery journals have been used to record frequency of imagery tasks and identify changes in emotions or mood over time (Blair et al., 2007; Meevissen et al., 2011b; Shambrook & Bull, 1996). Meevissen et al. had participants write in their journal for twenty minutes after the first imagery session when imagining their "best possible self" to ensure they were correctly performing the imagery (Meevissen et al., 2011b). During this journaling session, participants reflected on their emotions about their best possible self. Blair and Leyshon completed an imagery intervention study with novice and skilled soccer players (Blair et al., 2007). They also found the imagery journal beneficial to ensure completion of the imagery task and gather information about how often they completed their imagery sessions.

Lastly, research has shown keeping an imagery journal promotes adherence to the imagery intervention and assists assessing in intervention's effectiveness (Shambrook & Bull, 1996). In our study, the experimental group was required to complete a nine week motivational imagery intervention. The journal entries were used to assess interventions compliance in the experimental group. In addition, the purpose of the journal entries was to help participants in the experimental group reflect on what they imagined, how their imagery progressed, and any psychological changes that occurred. The journal entries were used only to assess psychological changes in the control group.

QUALTRICS

Qualtrics.com is a survey engine that was used by the researchers to send the participants the questionnaires (demographic information, Life Orientation Test, Satisfaction with Life Scale, International-Positive and Negative Affect Schedule-Short Form, Athlete Burnout Questionnaire, modified Motivational Imagery Ability Measure Scale, and end of study questionnaires) and journal entries. Qualtrics.com allows researchers to upload surveys, polls, and panels for participants to complete (Qualtrics.com). On Qualtrics.com, the researchers may indicate when the surveys and questionnaires may be launched and accessed by the participants. In addition, the researchers may address how long the participants have to complete the questionnaires and if they may close the survey and finish it later. In order to complete the questionnaires and surveys, researchers have to email the participants a link via Qualtrics.com. Once completing the survey or questionnaire, the participants may submit their responses and will no longer have access to it or the ability to change their answers.

Qualtrics.com is a beneficial survey engine because it allows participants in the study to complete questionnaires online, complete journal entries on their own time, eliminates the need for paper, and can automatically score questionnaires (Qualtrics.com). When setting up the surveys or questionnaires, the researchers may indicate the point value of each question. By using this feature, Qualtrics.com will automatically grade the questionnaire based on the responses provided, thereby, eliminating the possibility of calculation errors by the researchers. The data is then downloaded for analysis, again, eliminating clerical errors in transferring handwritten scores to electronic format (Qualtrics.com). Lastly, since Qualtrics.com is online, participants can complete their journal entries on their own time and at a convenient location with internet access.

CURRENT RESEARCH

Current research lacks information indicating a relationship between optimism and psychological well-being, positive affect, negative affect, and burnout in healthy collegiate athletes. In addition, past studies have not examined how these markers of psychological health may change in collegiate athletes with the use of an imagery intervention. Researchers have used various imagery interventions to alter an athlete's sport performance, but have not determined if imagery may affect their psychological health. More specifically, no studies have assessed if motivational general arousal imagery affects athlete dispositional optimism as well as overall health and well-being.

To address these important research gaps, the current study examined the relationship between markers of psychological health, specifically optimism, psychological well-being, affect, and burnout in collegiate student-athletes. In addition, this study examined whether trait

optimism and markers of psychological health were changed following completion of a daily motivational general arousal imagery intervention. This study provided further insight on how clinicians may more effectively psychologically treat collegiate student-athletes.

CHAPTER 3

METHODOLOGY

A block randomization design was utilized to complete this study. Utilization of this design allowed the researchers to assign the participants into groups based on their sports team. Participants were randomly assigned to control and experimental groups within each sport and team. The four questionnaires utilized to measure the markers of psychological health were the Lift Orientation Test (LOT), Satisfaction with Life Scale (SWLS), International Positive Affect and Negative Affect Schedule Short Form (I-PANAS-SF), and Athlete Burnout Questionnaire (ABQ). Participants were told they were completing a study on health and well-being. Once randomly assigned to a group, participants were given a brief description of the study. The specific procedures of the study are outlined below. Briefly, we examined how the psychological health outcomes correlated and the effects of an imagery intervention on perceptions of optimism and psychological health outcomes in collegiate student-athletes.

Recruitment

To recruit participants for this study, the researchers contacted the coaches and received permission to attend a team meeting at the beginning of the fall 2014 semester. During the team meeting, the researchers announced they were completing a nine week study on life experiences in varsity and club sport collegiate athletes. Participants were informed the study is completely voluntary and they do not have to participate, in addition, they could discontinue the study at any

point if they no longer felt comfortable participating. Participants were required to come to testing sessions two times throughout the semester (weeks one and nine) and complete one one-hour on-line testing session at the mid-point of the study. In addition, they were informed they would have to complete a short computer-based journal entry about their current psychological health three times a week for nine weeks. Athletes were also told they must meet the following criteria to meet the eligibility requirements for our study: 1) full time students at UNC Chapel Hill and 2) not currently rehabilitating for a time loss injury at the onset of the study. Participants were asked to provide their email, name, and sport and indicate if they would like to be contacted by the researchers to participate in the study. In addition, participants signed a consent form if they were interested in participating in the study.

Participants

Thirty-six Division I varsity and club sport athletes (28 female, 9 male) between the ages of 18-26 years old (22±4) participated in this study. The researchers recruited from a pool of approximately 350 student-athletes from 13 teams (6 NCAA varsity team, 7 club teams). One hundred and five student-athletes completed the consent form and indicated interest in participating in the study during recruitment. Of those interested in participating, sixty-five potential participants completed the patient history questionnaire. However, only thirty-seven participants attended the first testing session. One participant asked to be removed from the study following the first testing session and there was an attrition of nine people with the remainder of the study, thus resulting in 27 total participants.

Table 1. Attrition of Participants throughout the study.

Stage of Study	Total Participants
Recruitment	350

Consent	105
Patient history questionnaire	65
Time point 1	37
Time point 2	29
Time point 3	27

Inclusion

Participants were included if they were full time students at UNC Chapel Hill, English speaking, and healthy Division I varsity and club collegiate student-athletes. We chose to include both individual and team sports and female and male sports to broaden the generalizability of our study.

Exclusion

Participants were excluded if they did not meet the inclusion criteria or were currently being rehabilitated for a time loss injury at the onset of the study.

Instrumentation

Life Orientation Test (LOT)

The Life Orientation Test (LOT) reflects how much an individual expects favorable future outcomes (Scheier & Carver, 1985). The LOT is used to measure optimism (Carver et al., 2010; Rasmussen et al., 2009) and has been used in a variety of populations including Division I football players (Albinson & Petrie, 2003), Dutch participants ranging in ages 18-65 (Blackwell et al., 2013; Meevissen, Peters, & Alberts, 2011a), Australian athletes ranging in ages 16-34 (including football, basketball, cricket, field hockey, netball, and volleyball) (Ford et

al., 2000), high school athletes between the ages of 16-19 in individual (cross country skiing, golf, tennis, track and field) and team sports (ice-hockey, basketball, handball, soccer, and volleyball) (Gustafsson & Skoog, 2012), and undergraduate college students (Smith, Pope, & Rhodewalt, 1989). The SWLS consists of four positive, four negative, and four filler items that are rated on five point Likert scale. The participants rated each item based on a 5-point scale ranging from 0 (strongly disagree) to 4 (strongly agree) (Scheier & Carver, 1985).

The total score is calculated by averaging the items of the LOT together. When scoring the LOT, items 3, 8, 9, and 12 are reverse coded (Scheier & Carver, 1985) prior to averaging the total score. Once items 3, 8, 9, and 12 are reverse scores, the average of the twelve items was calculated to identify the overall LOT score. The total score indicates an individual's level of optimism with higher scores denoting higher levels of optimism.

The LOT has been shown to have test-retest reliability with undergraduate college students, with a test-retest correlation of 0.79 (Scheier & Carver, 1985). Scheier and Carver found the LOT to have internal consistency in a college student population (Scheier & Carver, 1985). The LOT has also been shown to have convergent and discriminant validity in a college student population (Scheier & Carver, 1985). In addition, the LOT has been shown to be effective in measuring optimism in previous collegiate athlete samples (Albinson & Petrie, 2003; DeFreese & Smith, 2014; Ford et al., 2000; Gustafsson & Skoog, 2012). Specifically, DeFreese and Smith found internal consistency reliability of the LOT for measuring optimism in collegiate athletes (Cronbach's alpha= 0.80) (DeFreese & Smith, 2014).

Satisfaction With Life Scale (SWLS)

The Satisfaction With Life Scale (SWLS) is a 5 item measure assessing participants overall evaluation of life satisfaction (see appendix D) (Diener, Emmons, Larsen, & Griffin, 1985). The SWLS uses a 7-point Likert scale (1= strongly disagree, 7= strongly agree). Well-being scores of the SWLS were calculated by averaging the scores of all five items. Higher scores of the SWLS indicated greater overall life satisfaction (Diener, 2006; Frank & Yawen, 2013) and lower scores indicate lower levels of life satisfaction (Diener, 2006).

The SWLS possesses test-retest reliability of 0.50 to 0.83 (with a two week to four year interval) (Kamil, Ferdi, Ahmet, & K.T., 2012). The SWLS has been shown to exhibit construct validity, convergent validity, and discriminant validity in college students (Chia-Huei, Lung, & Ying-Mei, 2009; Diener et al., 1985; Pavot & Diener, 1993). In addition, DeFreese and Smith found the SWLS to have significant internal consistency reliability for measuring life satisfaction in a collegiate athlete sample (Cronbach's alpha= 0.88-0.92) (DeFreese & Smith, 2014). The test has been shown to have longitudinal (two-month period) invariance in college university students as well (Chia-Huei et al., 2009). Our study consisted of collegiate student-athletes; therefore, we felt it best to use the SWLS to measure life satisfaction.

International Positive and Negative Affect Schedule- Short Form (I-PANAS-SF)

The PANAS short form was developed by Kercher using an elderly population (Kercher, 1992). Kercher's short form adaptation of the PANAS included 5 positive affect items (excited, enthusiastic, alert, inspired, determined) and 5 negative affect items (distressed, upset, scared, nervous, and afraid). Following Kercher's development of the short form PANAS, Mackinnon et al. further examined the tool and found the PANAS short form to be reliable throughout

several age groups (18-29, 30-44, 45-64, and 65 and over) (Mackinnon, Jorm, Christensen, Korten, Jacomb, & Rodgers, 1999). However, in 2007 Thompson adapted the PANAS short form due to the covariance between the items he used for positive affect and negative affect. The I-PANAS-SF consists of 10 items (5 positive affect items and 5 negative affect items). The positive affect items include: inspired, alert, attentive, active, and determine. The negative affect items consist of: afraid, upset, nervous, ashamed, and hostile. These items were chosen by Thompson due to the general understanding of the terms presented amongst the international participants in the study. Thompson found the new International PANAS short form (I-PANAS-SF) to exhibit cross-cultural validity, convergent validity, and test-retest reliability (Thompson, 2007). In this study, we examined affect as a trait and wanted the items to be understood internationally, thus we used the I-PANAS-SF (see Appendix B).

The PANAS identifies values of positive affect and negative affect. If an individual endorses high levels of negative affect and low levels of positive affect, they are likely to also experience more emotions that are negative (Crawford & Henry, 2004). Whereas, if the individual endorses high levels of positive affect and low levels of negative affect, they will experience more emotions that are positive (Crawford & Henry, 2004). For example, if an individual is anxious or depressed, then they are more likely to have high negative affect scores compared to someone who is not experiencing depression or anxiety (Crawford & Henry, 2004); however, they may not have low levels of positive affect because positive affect and negative affect have been shown to be independent of each other (Crawford & Henry, 2004). As a result, when analyzing affect in this research study, positive and negative affect were examined as two independent measures.

In this study we used the I-PANAS-SF due to its reliability and validity with individuals across cultures. Thompson identified the I-PANAS-SF to possess significant reliability for negative affect (Cronbach's alpha= 0.76) and positive affect (Cronbach's alpha= 0.78) in MBA international university students (Thompson, 2007). In the current study, subjects are asked to rate each item on a scale from 1 (never) to 5 (always) based on the question "Thinking about yourself and how you normally feel, to what extent do you generally feel (Thompson, 2007)?" Average scores for positive affect and negative affect were calculated. The higher the average score for positive affect indicated the individual possessed higher levels of positive affect. The higher the average score for negative affect suggested the participant had higher levels of negative affect.

Athletic Burnout Questionnaire (ABQ)

The Athletic Burnout Questionnaire (ABQ) is a 15-item self-report inventory containing three subscales: emotional and physical exhaustion, reduced sense of sport accomplishment, and sport devaluation (Raedeke & Smith, 2001a). Each emotional term is rated based on the question "How often do you feel this way (Raedeke & Smith, 2001a)?" Each item is rated on a five point Likert scale, 1 "almost never" to 5 "almost always (Raedeke & Smith, 2001a)." An overall burnout score can be calculated by averaging all the item responses of the three burnout dimensions (Chunxiao et al., 2013). Higher overall burnout scores indicate the individual possesses higher athlete burnout; whereas lower scores indicated the individual experiences less symptoms of athlete burnout.

This measurement has been use to compared athlete burnout and optimism (Gustafsson & Skoog, 2012; Gustafsson et al., 2013). They found all the dimensions of burnout to exhibit

reliability with Cronbach alpha's ranging from 0.83-0.87 (Gustafsson & Skoog, 2012). Within in the same study, optimism was found to possess a Cronbach alpha score of 0.67 when using the LOT (Gustafsson & Skoog, 2012). In addition, research has identified a significant negative correlation between optimism and each dimension of burnout in collegiate athletes when using the ABQ and LOT (DeFreese & Smith, 2014; Gustafsson & Skoog, 2012). Therefore, the ABQ was an empirically supported measurement choice for the current study since it had been used to compare these two psychological constructs in the past. In our study, we examined the scores of the athletes ABQ and LOT and identified how optimism associates with burnout. In addition, for the purpose of our study, we used the ABQ to identify burnout characteristics over the last nine weeks.

Scores for the ABQ were calculated for each of the subscales (emotional/physical exhaustion, reduced sense of accomplishment, and sport devaluation) and an overall burnout score. In order to calculate emotional/physical exhaustion, items 2, 4, 8, 10, and 12 are averaged together. When calculating reduced sense of accomplishment, items 1, 5, 7, 13, and 14 are averaged together. Prior to averaging the items together, items 1 and 14 must be reverse scored (5, 4, 3, 2, 1). Sport devaluation is calculated by averaging items 3, 6, 9, 11, and 15 together. The overall athlete burnout score was calculated by averaging all the items (1-14) together (Raedeke & Smith, 2009).

Raedeke and Smith completed a study refining the ABQ to ensure reliability within the athletic population (Raedeke & Smith, 2001a). In this study, the ABQ exhibited construct validity and reliability with an adolescent and collegiate athletic population (Raedeke & Smith, 2001a). Also, Raedeke and Smith found the ABQ to have construct validity when relating burnout to competitive trait anxiety, amotivation, enjoyment, commitment, and intrinsic

motivation (Raedeke & Smith, 2001a). The study indicated burnout is positively correlated with competitive trait anxiety and amotivation and negatively correlated to enjoyment, commitment, and intrinsic motivation (Raedeke & Smith, 2001a). In addition, a study completed by DeFreese and Smith indicated the ABQ exhibited high reliability for measuring each dimension of burnout in collegiate athletes, including emotional/physical exhaustion (Cronbach's alpha= 0.91), reduced accomplishment (Cronbach's alpha= 0.86), and sport devaluation (Cronbach's alpha= 0.89) (DeFreese & Smith, 2013); in addition overall burnout scores were found to be reliable (Cronbach's alpha= 0.92) (DeFreese & Smith, 2013).

The ABQ has been found to exhibit strong internal consistency reliability for each subscale (emotional/physical exhaustion, reduced sense of accomplishment, and devaluation) with alpha coefficients ranging from 0.84 to 0.91 (Raedeke & Smith, 2001b). Furthermore, the ABQ exhibited test-retest reliability over a period of seven to nine days in a population of cross-country runners with R values ranging from 0.86-0.92 (Raedeke & Smith, 2001b). Collectively, the aforementioned reliability and validity data informed our decision to utilize the ABQ to measures collegiate athlete burnout within the current study.

Modified Motivational Imagery Ability Measure Scale (MIAMS)

The Motivational Imagery Ability Measure Scale (MIAMS) is a measurement used to test an athlete's ability to complete motivational general-mastery imagery and motivational general-arousal imagery (Gregg & Hall, 2006; Gregg et al., 2011). When completing the MIAMS, participants read four scenarios and completed a 1-2 minute imagery session of each scenario. The participants completed four scenarios during the mid-point testing session and four scenarios during the final testing session, for a total of eight scenarios. Participants were asked to rate the

ease of conjuring each scenario they imagine from 1 (not at all easy) to 7 (very easy to form) and their emotional response to the image from 1 (no emotion) to 7 (very strong emotion). The average MIAMS scores of the four scenarios were calculated for ease and emotion. Higher scores for ease indicated the imagines were easier to form with the imagery intervention. The higher scores for emotion suggested the participant experienced more emotion during the imagery intervention.

For this study, the MIAMS was modified to include two of the original sports scenarios, two academics scenarios, two social scenarios, and two general health scenarios. Thus, the participants completed four imagery scenarios during each testing session, with the experimental group completing four during the midpoint testing session and both the control and experimental group completing four during the final testing session. Each scenario was visualized for approximately two minutes. The four scenarios were randomized so the participant would have one sport, academic, social, and general health scenario during each testing session. Then the researcher flipped a coin for each category to determine if the scenario would be included in the mid-point testing session or final testing session. The experimental group completed scenarios one, five, six, and seven during the mid-point testing session. The experimental and control group completed scenarios two, three, four, and eight during the final testing session (see Appendix E). The control group completed the modified MIAMS during the final testing session to analyze their ability to complete the imagery task.

Gregg and Hall used the MIAMS measurement to test competitive and recreational athlete's ability to complete motivational imagery (Gregg & Hall, 2006). They found significant Cronbach coefficients for emotion (Cronbach alpha = 0.74) and ease (Cronbach alpha = 0.73) (Gregg & Hall, 2006). They found a significant multivariate effect of the MIAMS with

competitive level athletes using a multivariate ANOVA ($p<0.01$) (Gregg & Hall, 2006). However, they found no significant effect of sport type (team vs. individual) or sex (male vs. female) ($p>0.05$) (Gregg & Hall, 2006). In addition, they found the MIAMS to have significant effects on emotional response ($p<0.01$) and ease ($p<0.01$) in all athletes (Gregg & Hall, 2006). In this measurement, ease refers to how easy it is for the individual to complete the imagery. Emotion refers to the amount of emotional response the participant experiences during the imagery task, in which a higher emotional response is better. Gregg and Hall's study found competitive athletes scored higher than recreational athletes on the MIAMS (Gregg & Hall, 2006).

Journal entries

The journal entries served multiple purposes in this study. The journaling sessions allowed participants to provide subjective measures throughout the study on emotional states and how they felt in general about their health and well-being. In addition, the experimental participants provided subjective information on how they felt during and following the imagery sessions. The journal entries helped the researchers assess how well the experimental participants adhered to the imagery intervention.

Both groups were asked to journal three times per week via Qualtrics.com, focusing on how they had felt since there last journaling session. The participants were asked to include three words to describe how they have felt lately (see Appendix I and J). The experimental group also discussed their imagery sessions in their journal entries. The experimental group was instructed to describe their imagery intervention, including the duration, frequency, and what they imagine (see Appendix I).

Pilot testing

Prior to introducing the imagery intervention and Life Experiences questionnaire to the participants of the study, the intervention was pilot tested with six college students over a two week period to ensure the reliability of the measurements used during the study and to identify any problems with the questionnaire on Qualtrics.com. During the first pilot testing session, the measurements of optimism (0.78), positive affect (0.81), psychological well-being (0.93), and athlete burnout (0.91) were all identified as reliable measurements (Cronbach's alpha > 0.700) (Nunnally, 1978). During the final pilot testing session, the measurements of optimism (0.93), psychological well-being (0.87), positive affect (0.87), athlete burnout (0.70) were all identified as reliable measurements with a Cronbach's Alpha greater than 0.700 (Nunnally, 1978). In both the first and final testing sessions, the measurement for negative affect was not found a reliable component of the I-PANAS-SF. The reliability of the modified MIAMS was examined during the pilot test. The emotion portion of the MIAMS was not found to be reliable, whereas the ease portion of the MIAMS was found to be reliable. Due to the lack of reliability with the emotion portion of the MIAMS, the wordings of the scenarios were altered to be more specific. In addition to examining the reliability of the measurements used during the study, researchers asked the participants of the pilot study to give the researcher feedback on the delivery of the study information (i.e. positivity, journal entries, and imagery). Based on the comments from the participants, adaptations were made to improve the delivery of the study, including providing a handout to the participants so they could more easily remember what they are responsible for doing between testing sessions and sending reminder emails about when to complete journal entries.

Procedures

Background information

After collecting the contact information from interested athletes, the researchers emailed the potential participants the patient history questionnaire via Qualtrics.com to receive information about demographics and psychological health. If the potential participant was uncomfortable answering any of the questions, they could skip the question or discontinue completing the questionnaire. The patient history questionnaire gathered demographic information including: age, race, sex, academic status, current semester load, sport at UNC Chapel Hill, position/event in primary sport, total years of experience in the primary sport, years of experience in the primary sport (redshirting and competing) at the collegiate level, injury history, history of psychological problems/eating disorders, current medications, and current interactions with a clinical psychologist or mental health professional. If participants indicated they were currently working with a clinical psychologist or mental health professional they were asked additional questions about their interactions with the psychologist (Appendix A). The participants were selected based on the inclusion criteria per their patient history questionnaire (Appendix A). If the participants indicated they were suffering from a time loss injury, were not a full time UNC- Chapel Hill student, and/or were not a UNC-Chapel Hill Division I varsity or club sport athlete then they were excluded from the study. Block randomization was used to assign individuals to control or experimental group by their respective teams. Specifically, once selected following completion of the patient history questionnaire, participants within their respective teams were each given a number and were randomized using a random number generator into either the control or experimental group by their team. The researcher filled out a

schedule via an online scheduling program indicating when she would be available throughout the week for the experimental and control testing sessions. There were multiple testing sessions available for each group throughout the week and the groups were tested separately. Participants were blind to which group they were assigned and were only given available testing slots based on what group they were in (i.e. controls and experimental group participants were only tested with their respective group members). Participants signed up for a testing session on an online scheduling program based on their availability and attended the testing session which they most preferred.

First testing session

During the first testing session, all participants were reminded they were participants in a study on life experiences in college athletes, given a brief description of the study, and completed the Qualtrics.com life experiences questionnaire. All the participants were told they would be asked to complete an on-line testing session during week five of the study and return during week nine for a one-hour testing session in a classroom at UNC. During the study, the experimental and control group each had separate testing sessions. During the 5th week session, all participants completed the Qualtrics.com life experiences questionnaire (LOT, SWLS, I-PANAS-SF, and ABQ) and receive an on-line PowerPoint booster session on positivity and their journal entries. In addition, the experimental group received a booster on the imagery task outlining what imagery is, how to perform the imagery, and were guided through practice sessions of the imagery task. At the final nine week session, participants again completed the Qualtrics.com life experiences questionnaire and be debriefed.

Once they were reminded of what would be asked of them throughout the study, the participants were asked to open their email and complete the online life experiences questionnaire (LOT, SWLS, I-PANAS-SF, and ABQ) and electronically signed a behavioral contract stating they would not discuss any part of this study with anyone, including other participants via Qualtrics.com. Then the researchers conducted a 10 minute journaling instructional session, including how to fill out the journals. It was made clear they would be asked to complete three 5 minute journal entries per week, which totaled to 27 journal entries throughout the nine week study. Participants were told the researchers would contact them via their email address throughout the study with journal entry reminders emails and to schedule the subsequent two sessions.

Experimental group

The experimental group received instructions on how to properly complete the motivational general-arousal imagery intervention, focusing on managing arousal, stress, and negative emotions (see Appendix K). During the first testing session, the experimental group practiced the 5 minute motivational general-arousal imagery technique as directed by the researchers. During this imagery practice session, participants were taken through three imagery tasks, including situations focusing on general health, academics, and social settings. Participants also received advice on how to improve vividness and controllability of the imagery sessions. They were instructed to concentrate on positive emotions while thinking about current life events and their surroundings (i.e. academics, sports, family, friends, etc.) when completing each imagery session. They were asked to perform this imagery intervention for approximately five minutes every day for nine weeks. The experimental group also completed a journal entry

three times a week documenting imagery frequency, effect of imagery on their lives, what they imagined (visualized), and listed three words to describe how they have felt lately (Appendix I).

Control group

Like the experimental group, control group received a 10 minute instructional lecture on the definition of positivity and how it can affect general health and well-being (Appendix K). The control participants were asked to journal at least three times per week via Qualtrics.com listing three words to describe how they have felt lately (Appendix J).

Mid-point testing session

During the 5th week, both groups completed mid-point testing and received positivity and journal booster sessions on-line via Qualtrics.com. The positivity booster portion addressed what positivity is and the benefits of positivity. The journal entries booster reviewed what they will be journaling about and the requirement of three journal entries per week. Throughout this week, all participants continued to complete their journal entries and the experimental group continued to complete their imagery task. During the 5th week on-line testing session, each participant completed the life experiences questionnaire (LOT, SWLS, I-PANAS-SF, and ABQ) via Qualtrics.com.

Experimental Group

The experimental group also had the MIAMS included in the life experiences questionnaire. The MIAMS portion of the life experiences questionnaire required the experimental participants to imagine four different scenarios and rate each based on ease and emotion.

In addition, the experimental group received an on-line Powerpoint booster session on motivational general-arousal imagery by going through the initial motivational general-arousal imagery training session again. All questions the experimental group had pertaining to the intervention technique were emailed to the researcher following testing session.

The experimental group's journal entry booster session reinforced the requirement of three journal entries per a week and important information including three words to describe how they have felt lately. In addition, the journal entries addressed questions pertaining specifically to the imagery intervention (frequency of imagery intervention and what they imagined).

Control Group

Participants in the control group viewed an on-line Powerpoint booster positivity lecture, which was the same positivity lecture they heard during the first testing session. Journal entry methodology was reinforced for both groups during their respective sessions. The journal entry booster reviewed the requirement of three journal entries per week on Qualtrics.com, journal entry methodology, and pertinent journal entry information (i.e. three words to describe how they have felt lately).

Final testing session

The participants met with the researchers for the final time during week nine of the study. Each participant completed the life experiences questionnaire (LOT, SWLS, I-PANAS-SF, ABQ, and modified MIAMS) in the final session via Qualtrics.com. Both the control and experimental group participants were required to complete the MIAMS portion of the life experiences questionnaire during the final testing session. Each participant received four

scenarios to imagine and rate on ease and emotion. The four MIAMS scenarios provided at the final testing session varied from the four scenarios during the mid-point testing session provided to the experimental group. Every participant completed an End of Study Questionnaire. The End of Study Questionnaires were completed using a five-point Likert scale (1 "very slightly/not at all," 5 "extremely"). These questionnaires were developed to identify subjective ratings, assess compliance, and the feasibility of incorporating this intervention into daily clinical practice. In addition, the participants were allowed to indicate if they would like to receive the results of the study. Following the final testing, every participant in the control and experimental groups received a debriefing about the study. During the debriefing, the instructor reviewed the study with the participants and asked if they had any questions and/or comments about the study.

Experimental Group

At the final testing, the experimental group completed a brief End of Study Questionnaire about the psychological imagery intervention (Appendix F). The experimental group End of Study Questionnaire addressed how the motivational imagery intervention and journal entries impacted their life.

Control Group

The control group completed a brief End of Study Questionnaire (Appendix G) addressing questions about the journal entries and positivity. In addition, the control participants were given the opportunity to receive instructions on how to properly complete the imagery intervention and given the opportunity to attend one follow-up training session following end of study testing.

Table 2. Study assessment timeline.

Group	Testing session		
	Baseline	**Mid-point (on-line)**	**Final**
Experimental	-Life experiences questionnaire -Journal entries lecture -Positivity lecture -Imagery lecture	-Life experiences questionnaire - modified MIAMS -Journal entries booster lecture -Positivity booster lecture -Imagery booster lecture	-Life experiences questionnaire -modified MIAMS -End of study questionnaire
Control	-Life experiences questionnaire -Journal entries lecture -Positivity lecture	-Life experiences questionnaire -Journal entries booster lecture -Positivity booster lecture	-Life experiences questionnaire -modified MIAMS -End of study questionnaire -Option to receive imagery lecture

Compliance/adherence

Throughout the study, the researchers required the participants to complete journal entries. The journal entries served as a tool to measure experimental participant's compliance to completing the imagery task. The journal entries addressed questions pertaining to the imagery task (i.e. frequency, duration, what they imagined, and how long they completed the task). In addition, both the control and experimental groups listed three words to describe how they have felt lately. Therefore, the journal entries may be used to assess compliance of the control group. Also, both groups attended two testing sessions and completed one on-line mid-point testing. All participants completed the behavioral questionnaire during the three testing sessions, which was used to explore compliance and adherence to the study.

Statistical Analysis

In this study, the independent variable was group. The dependent variables included the LOT, SWLS, I-PANAS-SF, and ABQ scores, journaling frequency, and journaling entry Likert responses. Descriptive analyses were performed to examine the block randomization of the participants based on demographics. In addition, descriptive analyses were completed to identify the means of each marker and optimism across the three time points. Correlation analyses were completed to identify correlations between the five variables (optimism, psychological well-being, positive affect, negative affect, and athlete burnout) at each time point (i.e. testing session one, two, and three). T-tests were performed to examined the level of each marker of psychological health (psychological well-being, positive affect, negative affect, and athlete burnout) and optimism at baseline. Exploratory analyses were also conducted to examine differences in these variables across groups at time point two and three.

The data from the four questionnaires in this study were analyzed using repeated analysis of variance (ANOVA) measures. The data from the life experiences questionnaire (LOT, SWLS, I-PANAS-SF, and ABQ) were compared for both the experimental and control groups. Correlational analyses were completed to address the relationship between the dependent variables. We used five separate repeated measures Analysis of variance's (ANOVA) to identify changes in optimism, psychological well-being, positive affect, negative affect, and athlete burnout. The a priori alpha level for this study was 0.05. Effect size categorized based on the suggested labels of Cohen's *d,* in which a small effect ranged from 0.000-0.010, a medium effect was approximately 0.059, and a large effect was 0.138 or greater (Warner, 2008). In addition, Bonferroni post-hoc tests were used to identify statistical significance among specific group contrasts.

Table 3. Table of variable analysis.

	Aim #	Instrument	Range	Measure
Independent variables				
Imagery intervention	2-3	Imagery task, modified MIAMS	1-7	Intervention vs. control
Dependent variables				
Optimism	1, 3	Life Orientation Test (LOT)	0-4	1. Correlation 2. ANOVA
Psychological Well-being	1-2	Satisfaction with Life Scale (SWLS)	1-7	1. Correlation 2. ANOVA
Positive Affect	1-2	International- Positive and Negative Affect Schedule (I-PANAS-SF) -short form	1-5	1. Correlation 2. ANOVA
Negative Affect	1-2	I-PANAS-SF	1-5	1. Correlation 2. ANOVA
Athlete Burnout	1-2	Athlete Burnout Questionnaire (ABQ)	1-5	1. Correlation 2. ANOVA

Power analysis

Assuming a one-sided type I error of .05 the study would have 80% power to detect a moderate to large effect size (ES = 0.5) with 102 participants (n=51 in each group). Other studies (Zagórska & Guszkowska, 2013) have reported much higher effect sizes using similar populations and protocols; therefore we are confident we will reach significance with 102 participants. However, due to predicted attrition we will attempt to recruit 100 participants.

The current study was an exploratory study examining the relationship between optimism and markers of psychological health, in addition to how an imagery intervention changes these factors. The current study had a small sample size (N=37) and did not meet the 80% power analysis needed. We were cautious when interpreting the null finds of this study. As a result of

our study being under-powered we are also careful to consider effect sizes of all analyses regardless of statistical significance.

Challenges

To increase participant retention, we made the mid-point testing accessible on-line. Therefore, the participants completed the testing and training on-line throughout the period of a week. They were responsible for completing the behavioral questionnaire and watching the booster lecture videos on journal entries, positivity, and imagery (for the experimental group).

We anticipated there would be attrition throughout the study due to the length of the study (9 weeks), in addition to the multiple testing sessions. Therefore, all data from only the first testing session (collapsed across control and experimental groups) were used to address the first research question in order to include as many participants as possible in the study.

Clinical Journals

Clinical aspects of this study were assessed by a journal kept by the primary researcher. The researcher detailed adjustments made to keep the participants engaged and understand the task better during the pilot study. Throughout the study, the researcher addressed the ease with which each testing session was administered, including information specifically on the journal entry lectures, positivity lectures, and imagery lectures. In addition, the researcher cataloged thoughts on the ease with which she was able to develop the scripts for the study, and input and analyze the data on Qualtrics.com. The information was recorded to help future clinicians with the use of this imagery tool and Qualtrics.com. The clinical journal was not statistically analyzed.

CHAPTER 4

MANUSCRIPT

INTRODUCTION

In 2011-2012, according to the National Collegiate Athletic Association, there were more than 450,000 student-athletes participating in collegiate sports (Neal et al., 2013). Student-athletes' must attend to both their physical and psychological health while participating in collegiate sport. A multitude of instances exist when a sports medicine professional, such as an athletic trainer, must consider the physical capabilities of athletes; for instance, during injury rehabilitation. However, the psychological aspect of a student-athlete's health maintenance and treatment should also be considered. Athletic injuries may lead to psychological disturbances, likely resulting from increased psychological stress (Neal et al., 2013). Accordingly, stressed-based demands and outcomes (i.e. intensive training, injury) associated with sport participation may impact several markers of psychological health, such as psychological well-being, affect, and athlete burnout, in addition to a variety of personality traits.

One personality trait with important implications for athlete psychological health is optimism. Optimism is the expectation of good circumstances occurring in the future (Eichner et al., 2014). Optimism is an important factor in psychological health and largely classified as a state or a trait attitude. State optimism changes in relation to the current circumstance or situation (Kluemper et al., 2009) while trait optimism refers to relatively stable differences in

optimism (Kluemper et al., 2009). Past researchers have indicated there is a positive relationship between trait optimism and adaptive outcomes of physical health (Carver et al., 2010; Lipowski, 2012; Rasmussen et al., 2009), mental health (Carver et al., 2010), and overall psychological well-being in the general population (Blackwell et al., 2013; Carver et al., 2010; Conversano et al., 2010; Meevissen et al., 2011b) and athletes between the ages of 16-30 (Lipowski, 2012). Though future work has begun to highlight the link between optimism with these aforementioned outcomes (psychological well-being, positive affect, negative affect, athlete burnout), both sports medicine and sport psychology practitioners would benefit from further examination of how optimism, may be associated with additional outcomes of athlete psychological health. If there an association between these two factors is supported, then it will give clinicians additional information on how they should consider individual athlete differences in optimism when working with and/or treating their athlete's.

The demands of the collegiate athlete experience (i.e. psychological well-being, affect, and burnout) also have important implications for markers of athlete psychological health. These student-athlete psychological experiences are also influenced by individual traits, including optimism. Thus, a method of improving optimism may help student-athletes successfully cope with such mental and physical demands they are subjected to daily. However, evidence supporting optimism manipulation has been inconclusive due to the trait and state distinction (Blackwell et al., 2013; Carver et al., 2010; Meevissen et al., 2011b). Carver et al. concluded optimism is a relatively stable personality trait that may be manipulated using an intervention, but due to the innate stability of trait optimism, the changes evoked by the intervention may not be significant or clinically relevant (Carver et al., 2010).

Identifying a method for improving optimism would have positive effects on a several aspects of a student-athletes life, including their psychological health. One method used in past studies as an attempt to promote athlete optimism and psychological health is an imagery intervention (Blackwell et al., 2013; Meevissen et al., 2011b). Imagery is a mental process that includes generating positive thoughts, controlling those thoughts, and vividly imagining positive future events (Blackwell et al., 2013; Meevissen et al., 2011b). Accordingly, imagery techniques have been used to significantly increase optimism in non-athletic populations (Blackwell et al., 2013; Meevissen et al., 2011b). Research studies have examined the use of imagery as a means to focus on future events and the perception of those events (Blackwell et al., 2013; Meevissen et al., 2011b). In addition, research studies have demonstrated optimism may be manipulated via utilization of imagery to visualize future events (Blackwell et al., 2013; Meevissen et al., 2011b). Imagery has been used specifically in athletic populations to promote motivation and performance during practice and competition (Blair et al., 2007; Munroe-Chandler et al., 2007). In these studies, athletes have found imagery to be beneficial by helping them to visually recreate competitive situations and link these imaged scenarios to the appropriate cognitive, affective, and/or behavioral responses (Blair et al., 2007; Munroe-Chandler et al., 2007). Despite these many benefits, research studies to date have not focused on the benefits of imagery relative to athlete optimism and markers of psychological health. As a result, it is necessary to study whether imagery may produce significant changes in optimism, and ultimately psychological health, in athlete populations. Such information will add to the broader knowledge base on the use of psychological skills, like imagery, to promote outcomes of athlete psychological health.

Beyond potential increase in optimism itself, promotion of student athlete optimism through imagery use may also have important implications for markers of athlete psychological

health. Psychological health is a multi-faceted construct measured through a variety of psychosocial markers including psychological well-being, positive affect, negative affect, and athlete burnout. Affect is the extent a person experiences engagement with the environment, whether it is pleasant or unpleasant (Crawford & Henry, 2004), and can therefore be classified as either positive or negative. Positive affect is associated with positive emotions such as pride, love, and happiness (Lazarus, 1991, 1993), whereas negative affect is linked to maladaptive psychological responses such as depression and anxiety (Crawford & Henry, 2004). In an athletic population, positive and negative affect levels can alter how an individual perceives and physically adapts to a sport. For instance, an individual with elevated positive affect may have increased motivation to work harder at practice in an effort to improve performance compared to someone with low positive affect levels (Wilson et al., 2002). In addition, an athlete with high negative affect may have increased feelings of anxiety causing them to move their focus from competing well to worrying about not being successful compared to those with low negative affect (Wilson et al., 2002). Thus, affect is an important psychological variable affecting both physical and psychological facets salient to athletic performance.

Another psychological health outcomes linked to optimism is athlete burnout which Raedeke defined as a cognitive affective syndrome encompassing several symptoms including: physical and emotional exhaustion, reduced sense of accomplishment and sport devaluation (Raedeke, 1997). Research has identified a significant negative correlation between optimism and each dimension of burnout in collegiate athlete populations (DeFreese & Smith, 2014; Gustafsson & Skoog, 2012). Moreover, DeFreese and Smith identified trait optimism as a potential protective factor against athlete burnout (DeFreese & Smith, 2014). Optimism has been shown to relate to positive coping mechanisms in addition to mental toughness (Nicholls,

Polman, Levy, & Backhouse, 2008). As a result, optimism may help decrease the frequency of several negative factors that may be associated with burnout and detrimental to psychological health, such as low social support, chronic stress, injuries, psychological withdrawal, and lower school performance (Gould et al., 1996). Moreover, beyond burnout, an intervention used to improve optimism in student-athletes would also be valuable for improving the psychological health marker of well-being.

Finally, past research studies have shown mental imagery as a useful tool for increasing optimism levels and broaden the understanding of psychological health outcomes (Blackwell et al., 2013; Meevissen et al., 2011b). Research studies have used imagery to focus on future events and the perception of those events. For instance, Meevissen et al completed a study that required the participants to imagine their "best possible self" to increase levels of optimism (Meevissen et al., 2011b). In this study, participants were asked to write down all aspects their future best possible self should encompass (personal domain, relational domain, and professional domain) (Meevissen et al., 2011b). They were then asked to use imagery daily to recreate that situation mentally for the subsequent two weeks, which resulted in a significant increase in optimism. Blackwell et al. completed another study examining the relationship between optimism and imagery relationship and concluded that elevated vividness, a key aspect of effective imagery use, could lead to higher levels of optimism (Blackwell et al., 2013). Cumulatively, the extant research on the impact of imagery on optimism and psychological health outcomes in the general population is impactful. However, future research examining these relationships in athlete populations is warranted.

In the 2013 position statement "Inter-Association Recommendations for Developing a Plan to Recognize and Refer Student-Athletes With Psychological Concerns at the Collegiate

Level: An Executive Summary of a Consensus Statement," the National Athletic Trainers' Association emphasized the current need and importance of examining the psychological health of collegiate athletes (Neal et al., 2013). Guided by this statement, it is important for researchers to examine the relationships among optimism, markers of athlete psychological health, and imagery. Specifically, to feel an important knowledge gap between psychological health and optimism, research needs to examine the relationship between markers of psychological health and methods for improving those markers and optimism. Moreover, there is empirical and clinical benefit to exploring whether imagery can be utilized to promote athlete optimism and whether it may also have implications for specific markers of athlete psychological health (i.e. psychological well-being, positive affect, negative affect, athlete burnout). In order to ensure the effectiveness of the intervention, studies should focus on understanding these relationships in a healthy athlete population prior to their investigated with injured collegiate athletes. By observing healthy athletes, researchers will have further understanding of athletes' abilities to complete an imagery task when healthy.

The current study examined athlete optimism and psychological health outcomes in collegiate student-athletes following an imagery-based psychological intervention in a collegiate clinical setting, which to our knowledge has not been studied previously. The primary purpose of this study was to examine the relationship between optimism and psychological health (including psychological well-being, positive affect, negative affect, and athlete burnout). The secondary purpose was to explore if and to what degree collegiate student-athlete optimism can be manipulated with a motivational imagery intervention. Our final purpose was to identify how markers of psychological health are affected in collegiate student-athletes after a nine week motivational imagery intervention. We hypothesized collegiate student-athlete baseline trait

optimism would be positively correlated with baseline psychological well-being and positive affect and negatively correlated with negative affect and burnout. In addition, we hypothesized that the healthy collegiate student-athletes who received the motivational imagery intervention would exhibit higher levels of trait optimism as compared to untrained control participants at follow up. Finally, we had four specific hypotheses regarding our motivational imagery intervention and athlete's markers of psychological health. First, we hypothesized athletes exposed to the motivational imagery intervention will exhibit higher levels in psychological well-being as compared to controls. Second, we hypothesized athletes exposed to the motivational imagery intervention will exhibit higher levels in positive affect as compared to controls. Third, we hypothesized athletes exposed to the motivational imagery intervention will exhibit no change (i.e. lack of an increase) in negative affect as compared to controls. Fourth, we hypothesized athletes exposed to the motivational imagery intervention will exhibit no change (i.e. lack of an increase) burnout as compared to controls. We expected no change to occur to negative affect and athlete burnout because, over the course of a semester, we expected collegiate athletes to naturally experience an increase in these negative markers. Thus, we hoped our intervention would limit negative affect and athlete burnout from occurring.

METHODS

Research Design

A block randomization design was utilized for this study. This design allowed the researchers to assign the participants into groups based on their sports team. Participants were randomly assigned to control and experimental groups within each sport and team. Participants

were told they were completing a study on health and well-being. Once randomly assigned to a group, participants were given a brief description of the study.

Participants

Participants were included if they were full time students at UNC Chapel Hill, English speaking, and NCAA Division I varsity and club collegiate student-athletes. We chose to include individual and team sports and female and male sport athletes to broaden the generalizability of our study. Participants were excluded if they did not meet the inclusion criteria or were currently being rehabilitated for a time loss injury at the onset of the study.

Thirty-seven (28 female, 9 male) Division I varsity (fencing, field hockey, swimming and diving, and wrestling) and club sport athletes (field hockey, men's soccer, rugby, women's soccer, and swimming) between the ages of 18-26 years old (22±4) participated in this study (Table 4). Eleven NCAA varsity coaches were contacted and six coaches gave permission to speak with the teams. In addition, all club representatives were contacted. Out of the 350 recruited athletes on 13 teams, 105 student-athletes completed the consent form and indicated interest in participating in the study during recruitment. Sixty-six potential participants completed the patient history questionnaire and thirty-seven participants attended the first testing session (one participant declined participation following this session). Twenty-seven participants completed all three testing sessions.

Table 4. Participants Demographics following first testing session.

	All participants		Experimental group		Control group		p-value for T-test
Sport	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**	**0.82**
Varsity Field Hockey	*6*	*16.2*	*3*	*15.0*	*3*	*17.6*	
Varsity Swimming and Diving	*6*	*16.2*	*3*	*15.0*	*3*	*17.6*	
Varsity Wrestling	*1*	*2.7*	*1*	*5.0*	*0*	*0.0*	
Varsity Fencing	*4*	*10.8*	*2*	*10.0*	*2*	*11.8*	
Varsity Total	**17**	**45.9**	**9**	**45.0**	**8**	**47.1**	**0.53**
Club Rugby	*8*	*21.6*	*5*	*25.0*	*3*	*17.6*	
Club Women's Soccer	*2*	*5.4*	*1*	*5.0*	*1*	*5.9*	
Club Swimming	*7*	*18.9*	*4*	*20.0*	*3*	*17.6*	
Club Men's Soccer	*1*	*2.7*	*1*	*5.0*	*0*	*0.0*	
Club Field Hockey	*2*	*5.5*	*0*	*0.0*	*2*	*11.8*	
Club Total	**20**	**54.1**	**11**	**55.0**	**9**	**52.9**	**0.36**
Sport Category							**0.86**
Individual	*18*	*48.6*	*10*	*50.0*	*8*	*47.1*	
Team	*19*	*51.4*	*10*	*50.0*	*9*	*52.9*	
Gender							**0.92**
Male	*9*	*24.3*	*5*	*25.0*	*4*	*23.5*	
Female	*28*	*75.7*	*15*	*75.0*	*13*	*76.5*	
Age							**0.53**
18	*11*	*29.7*	*7*	*35.0*	*4*	*23.5*	
19	*12*	*32.4*	*6*	*30.0*	*6*	*35.3*	
20	*7*	*18.9*	*5*	*25.0*	*2*	*11.8*	
21	*4*	*10.8*	*1*	*5.0*	*3*	*17.6*	
22	*1*	*2.7*	*0*	*0.0*	*1*	*5.9*	
23	*0*	*0.0*	*0*	*0.0*	*0*	*0.0*	
24	*1*	*2.7*	*0*	*0.0*	*1*	*5.9*	
25	*0*	*0.0*	*0*	*0.0*	*0*	*0.0*	
26	*1*	*2.7*	*1*	*5.0*	*0*	*0.0*	
Race							**0.70**
Caucasian	*29*	*78.4*	*17*	*85.0*	*13*	*76.5*	
African American	*3*	*8.1*	*0*	*0.0*	*3*	*17.6*	
Hispanic/Spanish	*3*	*8.1*	*1*	*5.0*	*1*	*5.9*	
Asian	*2*	*5.4*	*2*	*10.0*	*0*	*0.0*	

Procedures

Background information

After collecting the contact information from interested athletes, the researchers emailed the potential participants a patient history questionnaire via an online survey interface to receive information about demographics and psychological health. If the potential participant was uncomfortable answering any of the questions, they could skip the question or discontinue completing the questionnaire. The patient history questionnaire gathered demographic information including: age, race, sex, academic status, current semester load, sport, position/event in primary sport, total years of experience in the primary sport, years of experience in the primary sport (redshirting and competing) at the collegiate level, injury history, history of psychological problems/eating disorders, current medications, and current interactions with a clinical psychologist or mental health professional. This information was used to determine study eligibility and randomization of eligibly participants.

Randomization and Scheduling

Eligible participants were randomized by team using a random number generator into either the control or experimental group (all participants on a team received a number and that team was randomized to control or experimental). Participants were blind to which group they were assigned. The researcher filled out a schedule via an online scheduling program indicating when she would be available throughout the week for the experimental and control testing sessions. There was multiple testing sessions available for each group throughout the week. The

primary researcher met separately with the participants assigned to the experimental and control groups at time point one to reinforce their group blinding.

First testing session

During the first testing session, all participants were reminded they were participants in a study on life experiences in college athletes, given a brief description of the study, and completed the Qualtrics.com life experiences questionnaire. All the participants were told they would be asked to complete an on-line testing session during week five of the study and return during week nine for a one-hour testing session in a classroom at UNC.

Once they were reminded of what would be asked of them throughout the study, the participants were asked to open their email and complete the Qualtrics.com Life Experiences questionnaire (LOT, SWLS, I-PANAS-SF, and ABQ) and electronically signed a behavioral contract stating they would not discuss any part of this study with anyone, including other participants via Qualtrics.com. Then the researchers conducted a 10 minute journaling instructional session, including how to fill out the journals. It was made clear they would be asked to complete three 5 minute journal entries per week, which totaled to 27 journal entries throughout the nine week study. The participants were told the researchers would contact them via their email address throughout the study with journal entry reminders emails and to schedule the final testing session. In addition, both groups received a 10 minute instructional lecture on the definition of positivity and how it can affect general health and well-being.

Experimental group

The experimental group received instructions on how to properly complete the motivational general-arousal imagery intervention, focusing on managing arousal, stress, and negative emotions. The imagery technique consisted of the participants imaging a general situation of their choice (i.e. social setting, academic setting, personal life situation) and focus on the positive emotions that occur with that situation. If they were experiencing negative emotions with a situation, they were guided on how to change those emotions to be positive. During the first testing session, the experimental group practiced the 5 minute motivational general-arousal imagery technique as directed by the researchers. During this imagery practice session, participants were taken through three imagery tasks, including situations focusing on general health, academics, and social settings. Participants also received advice on how to improve vividness and controllability of the imagery sessions. They were instructed to concentrate on positive emotions while thinking about current life events and their surroundings (i.e. academics, sports, family, friends, etc.) when completing each imagery session. They were asked to perform this imagery intervention for approximately five minutes every day for nine weeks. The experimental group also asked to complete a journal entry three times a week documenting imagery frequency, effect of imagery on their lives, what they imagine, and listed three words to describe how they have felt lately.

Mid-point testing session

During the 5th week, both groups completed mid-point testing and received positivity and journal booster sessions on-line via Qualtrics.com. The positivity booster portion addressed what positivity is and the benefits of positivity. The journal entries booster reviewed what they

will be journaling about and the request to complete three journal entries per week. In addition, the experimental group received a booster session on the imagery task, including the expectations of the imagery task and how to properly complete imagery sessions. Throughout this week, all participants continued to complete their journal entries and the experimental group continued to complete their imagery task. During the 5th week on-line testing session, each participant completed the life experiences questionnaire (LOT, SWLS, I-PANAS-SF, and ABQ) via Qualtrics.com. The experimental group also had the modified MIAMS included in the life experiences questionnaire. The modified MIAMS portion of the life experiences questionnaire required the experimental participants to imagine four different scenarios for 1-2 minutes each and rate each based on ease and emotion.

Final testing session

The participants met with the researchers for the final time during week nine of the study. Each participant completed the Life Experiences questionnaire (LOT, SWLS, I-PANAS-SF, ABQ, and modified MIAMS) in the final session via Qualtrics.com. Both the control and experimental group participants were required to complete the modified MIAMS portion of the life experiences questionnaire during the final testing session. Each participant received four scenarios to imagine and rate on ease and emotion. The four modified MIAMS scenarios provided at the final testing session encompassed the same subject matter (general health, social stress, academic life), but varied in content from the four scenarios presented during the mid-point testing session provided to the experimental group. Every participant completed an End of Study Questionnaire. The End of Study Questionnaires were completed using a five-point Likert scale (1 “very slightly/not at all,” 5 “extremely”). These questionnaires were developed to identify subjective ratings, assess compliance, and the feasibility of incorporating this

intervention into daily clinical practice. The experimental group also answered questions pertaining to the imagery intervention in the End of Study Questionnaire. In addition, the participants were allowed to indicate if they would like to receive the results of the study. Following the final testing, every participant in the control and experimental groups received a debriefing about the study. During the debriefing, the instructor reviewed the study with the participants and asked if they had any questions and/or comments about the study. In addition, the control participants were given the opportunity to receive instructions on how to properly complete the imagery intervention and given the opportunity to practice the imagery intervention at the end of the final testing session.

Table 5. Study assessment outline.

Group	**Testing session**		
	Baseline	**Mid-point (on-line)**	**Final**
Experimental	-Life experiences questionnaire -Journal entries lecture -Positivity lecture -Imagery lecture	-Life experiences questionnaire - modified MIAMS -Journal entries booster lecture -Positivity booster lecture -Imagery booster lecture	-Life experiences questionnaire -modified MIAMS -End of study questionnaire
Control	-Life experiences questionnaire -Journal entries lecture -Positivity lecture	-Life experiences questionnaire -Journal entries booster lecture -Positivity booster lecture	-Life experiences questionnaire -modified MIAMS -End of study questionnaire -Option to receive imagery lecture

Instrumentation

There were several instruments used throughout the current study to examine changes in optimism and the markers of psychological health. The Life Orientation Test (LOT) measured optimism. The Satisfaction with Life Scale (SWLS) measured psychological well-being. The International Positive and Negative Affect Schedule- Short Form (I-PANAS-SF) measured positive affect and negative affect. Also, the Athlete Burnout Questionnaire (ABQ) measure athlete burnout. The modified Motivational Imagery Ability Measure Scale (MIAMS) was used to examine how well the participants could complete the imagery intervention. All measures were pilot tested prior to completion of the current study.

Life Orientation Test (LOT)

The Life Orientation Test (LOT) reflects how much an individual expects favorable future outcomes (Scheier & Carver, 1985). The LOT is used to measure optimism (Carver et al., 2010; Rasmussen et al., 2009) and has been used in a variety of populations including Division I football players (Albinson & Petrie, 2003), Australian athletes ranging in ages 16-34 (including football, basketball, cricket, field hockey, netball, and volleyball) (Ford et al., 2000), high school athletes in individual (cross country skiing, golf, tennis, track and field) and team sports (ice-hockey, basketball, handball, soccer, and volleyball) (Gustafsson & Skoog, 2012), and undergraduate college students (Smith et al., 1989). It consists of four positive, four negative, and four filler items that are rated on five point Likert scale. The participants rated each item based on a 5-point scale ranging from 0 (strongly disagree) to 4 (strongly agree) (Scheier & Carver, 1985). After reverse scoring appropriate items, the total score is calculated by averaging the items of the LOT together (Scheier & Carver, 1985). The total mean score indicates an

individual's level of optimism with higher scores denoting higher levels of optimism. The LOT has been shown to exhibit validity when measuring dispositional optimism in collegiate athlete populations (Albinson & Petrie, 2003; DeFreese & Smith, 2014; Ford et al., 2000; Gustafsson & Skoog, 2012). DeFreese and Smith found support for the internal consistency reliability for assessing optimism in collegiate athletes (Cronbach's alpha= 0.80) (DeFreese & Smith, 2014). The LOT possessed high internal consistency reliability in the current study across three testing sessions (Cronbach's alpha= 0.83-0.86).

Satisfaction With Life Scale (SWLS)

The Satisfaction With Life Scale (SWLS) is a 5 item measure assessing participants overall evaluation of life satisfaction (see appendix D) (Diener et al., 1985). The SWLS uses a 7-point Likert scale (1= strongly disagree, 7= strongly agree). Well-being scores of the SWLS were calculated by averaging the scores of all five items. Higher mean scores of the SWLS indicated greater overall life satisfaction (Diener, 2006; Frank & Yawen, 2013) and lower mean scores indicated lower levels of life satisfaction (Diener, 2006). The SWLS has exhibited construct validity, convergent validity, and discriminant validity in college students (Chia-Huei et al., 2009; Diener et al., 1985; Pavot & Diener, 1993). In addition, DeFreese and Smith found the SWLS to exhibit significant internal consistency reliability and validity for measuring life satisfaction in a collegiate athlete population (Cronbach's alpha= 0.88-0.92) (DeFreese & Smith, 2014). The test has been shown to have longitudinal (two-month period) invariance in college university students as well (Chia-Huei et al., 2009). The SWLS possessed high internal consistency reliability throughout the three testing sessions of the current study (Cronbach's alpha= 0.82-0.93).

International Positive and Negative Affect Schedule- Short Form (I-PANAS-SF)

The I-PANAS-SF consists of 10 items (5 positive affect items and 5 negative affect items). The positive affect items include: inspired, alert, attentive, active, and determine. The negative affect items consist of: afraid, upset, nervous, ashamed, and hostile. Subjects are asked to rate each item on a scale from 1 (never) to 5 (always) based on the question "Thinking about yourself and how you normally feel, to what extent do you generally feel (Thompson, 2007)?" Average scores for all 5 positive affect and 5 negative affect items were calculated. The higher the average score for positive affect indicated the individual possessed higher levels of positive affect. The higher the average score for negative affect suggested the participant had higher levels of negative affect. In this study we used the I-PANAS-SF due to its reliability and validity with individuals across cultures. Thompson identified the I-PANAS-SF to possess significant reliability for negative affect (Cronbach's alpha= 0.76) and positive affect (Cronbach's alpha= 0.78) in MBA international university students (Thompson, 2007). In addition, Thompson found the I-PANAS-SF to possess validity in measuring positive affect (Cronbach's alpha= 0.75) and negative affect (Cronbach's alpha= 0.76) in three samples of individuals between the ages of 15-84 (Thompson, 2007). The I-PANAS-SF in the current study was found to possess high reliability for positive affect across all three testing sessions (Cronbach's alpha= 0.72-0.77). Negative affect possessed high reliability during the second testing session (Cronbach's alpha= 0.72); however, the reliability was less reliable (Cronbach's alpha < 0.70) during the first testing session (Cronbach's alpha= 0.66) and final testing session (Cronbach's alpha= 0.68).

Athletic Burnout Questionnaire (ABQ)

The Athletic Burnout Questionnaire (ABQ) is a 15-item self-report inventory containing three subscales: emotional and physical exhaustion, reduced sense of sport accomplishment, and sport devaluation (Raedeke & Smith, 2001a). Each emotional term is rated based on the question "How often do you feel this way (Raedeke & Smith, 2001a)?" Each item is rated on a five point Likert scale, 1 "almost never" to 5 "almost always (Raedeke & Smith, 2001a)." After reverse scoring two items, an overall mean burnout score can be calculated by averaging all the item responses (1-15) of the three burnout dimensions (Chunxiao et al., 2013; Raedeke & Smith, 2009). Higher overall mean burnout scores indicate the individual possesses higher athlete burnout; whereas lower scores indicated the individual experiences less symptoms of athlete burnout. The measure has been shown to possess internal consistency reliability (Cronbach's alpha= 0.92) in collegiate athlete populations and has been supported as a valid measure of overall athlete burnout (DeFreese & Smith, 2013; Raedeke & Smith, 2001b). Within the current study, the ABQ was found to possess internal consistency reliability throughout the three testing sessions (Cronbach's alpha= 0.88-0.92).

Modified Motivational Imagery Ability Measure Scale (MIAMS)

The Motivational Imagery Ability Measure Scale (MIAMS) is a measurement used to assess an athlete's ability to complete motivational general-mastery imagery and motivational general-arousal imagery (Gregg & Hall, 2006; Gregg et al., 2011). When completing the MIAMS, participants read four scenarios and complete an imagery session of each scenario. For this study, the MIAMS was modified to include two of the original sports scenarios, two academics scenarios, two social scenarios, and two general health scenarios. The participants

completed four scenarios during the mid-point testing session and four scenarios during the final testing session, totaling to eight scenarios. Participants rate the ease of conjuring each scenario they imagine from 1 (not at all easy) to 7 (very easy to form) and their emotional response to the image from 1 (no emotion) to 7 (very strong emotion). The average MIAMS scores of the four scenarios were calculated for ease and emotion. Higher scores for ease indicated the imagines were easier to form with the imagery intervention. The higher scores for emotion suggested the participant experienced greater emotional responses during the imagery intervention. Gregg and Hall used this measurement to test competitive and recreational athlete's ability to complete motivational imagery (Gregg & Hall, 2006). They found significant Cronbach coefficients for emotion (Cronbach alpha = 0.74) and ease (Cronbach alpha = 0.73) (Gregg & Hall, 2006). In addition, Gregg and Hall found the MIAMS to exhibit validity for measuring ease and emotion during imagery tasks in team and individual sports and at different levels (i.e. recreational, varsity, national, and international) (Gregg & Hall, 2006). In the current study, the modified MIAMS exhibited high internal consistency reliability for ease during the second testing session (Cronbach's alpha= 0.80) and final testing session (Cronbach's alpha= 0.77). In addition, the MIAMS possessed high internal consistency reliability for emotion during the second testing session (Cronbach's alpha= 0.88) and final testing session (Cronbach's alpha= 0.75).

Journal entries

Both groups were asked to journal three times per week via Qualtrics.com, including three words to describe how they have felt lately. The journaling sessions allowed participants to provide subjective measures throughout the study on emotional states and how they felt in general about their health and well-being. Also, the journal entries helped the researchers assess

how well the experimental participants adhered to the imagery intervention. Information regarding the frequency of completion of the journal entries was collected. All control participants completed at least one journal entry per week (N=17); of those fifteen participants completed two journal entries per week. The experimental group had thirteen participants complete at least one journal entry per week (N=19); of those seven participants completed at least two journal entries per week. In addition, the experimental group discussed their imagery intervention, including the duration, frequency, and what they imagine.

Statistical Analysis

In this study, the independent variable was group (control vs experimental). The dependent variables included the I-PANAS-SF, SWLS, LOT, and ABQ scores, journaling frequency, and journaling entry Likert responses. Research questions of interest we examined via the following analyses. Descriptive analyses were performed to examine the block randomization of the participants based on demographics. In addition, descriptive analyses were completed to identify the means of each marker and optimism across the three time points. Correlation analyses were completed to identify correlations between the five dependent variables (optimism, psychological well-being, positive affect, negative affect, and athlete burnout) at each time point (i.e. testing session one, two, and three). The direction of the correlation was determined by the negativity or positivity of the value. Statistical significance was identified with an alpha of 0.05. T-tests were performed to examined the level of each marker of psychological health (psychological well-being, positive affect, negative affect, and athlete burnout) and optimism at baseline.

We used five separate repeated measures Analysis of variance's (ANOVA) to examine potential changes in the dependent variables of optimism, psychological well-being, positive affect, negative affect, and athlete burnout. The a priori alpha level for this study was 0.05. The a priori alpha level for this study was 0.05. Effect sizes were categorized based on the suggested labels of Cohen's *d,* in which a small effect ranged from 0.000-0.010, a medium effect was approximately 0.059, and a large effect was 0.138 or greater (Warner, 2008). In addition, Bonferroni post-hoc tests were used to identify statistical significance among specific group and testing session contrasts.

Results

Bivariate correlations among study variables (optimism, psychological well-being, positive affect, negative affect, and athlete burnout) were calculated for the participant data obtained during testing session one (baseline) (See Table 6). Athlete burnout was significantly positively correlated with negative affect (p=0.036) and significantly negatively correlated with psychological well-being (p=0.045) and optimism (p=0.003). Positive affect was significantly negatively correlated with negative affect (p=0.026). Negative affect was significantly positively correlated with burnout (p=0.036) and negatively correlated with positive affect (p=0.026), psychological well-being (p=0.019) and optimism (p<0.0001). Psychological well-being was significantly positively correlated with optimism (p<0.0001).

Table 6. Correlations for entire study sample (N=37) appear in the table above. *p<0.05

Variable	ABQ	PA	NA	SWLS	LOT
ABQ					
PA	-0.316				
NA	0.346*	-0.367*			
SWLS	-0.331*	0.248	-0.385*		
LOT	-0.480*	0.314	-0.620*	0.579*	

Within the experimental group (see Table 7), the correlation analysis indicated a significant negative correlation between negative affect and optimism (p=0.013; -0.542). Within the control group (see Table 8), there was a significant correlation between burnout, negative affect, psychological well-being, and optimism. Positive affect did not significant correlate with any of the other variables in either the control or experimental groups.

Table 7. Correlations for experimental group sample (N=20) appear in the table above. *p<0.05

Variable	ABQ	PA	NA	SWLS	LOT
ABQ					
PA	-0.430				
NA	0.228	-0.403			
SWLS	-0.114	0.199	-0.15		
LOT	-0.327	0.226	-0.542*	0.221	

Table 8. Correlations for control group sample (N=17) appear in the table above. *p<0.05

Variable	ABQ	PA	NA	SWLS	LOT
ABQ					
PA	-0.166				
NA	0.495*	-0.300			
SWLS	-0.565*	0.285	-0.588*		
LOT	-0.657*	0.375	-0.677*	0.848*	

Five independent t-tests were performed to evaluate the difference in each variables measure (optimism, psychological well-being, positive affect, negative affect, athlete burnout) between the experimental and control group at each testing session (i.e. time point) (see Table 9). There was no significant difference in any variable between groups at any of the three time points. It was important for there to not be a significant difference between groups for any of the variables at time point one since it was baseline testing.

Table 9. Five independent t-tests for study variables at each of the three time points.

Variable	Time point	T-values	DF	Sig (2-tailed)	Mean difference
Burnout	1	-0.149	35	0.882	-0.03294
	2	0.158	27	0.876	0.03537
	3	-0.198	25	0.845	-0.05606
Positive affect	1	0.761	35	0.452	0.12588
	2	0.339	27	0.737	0.06857
	3	-0.462	25	0.648	-0.08068
Negative affect	1	-0.876	35	0.387	-0.13647
	2	-0.512	27	0.613	-0.10381
	3	-0.202	25	0.842	-0.03750
Optimism	1	0.935	35	0.356	0.16317
	2	1.742	27	0.093	0.32778
	3	0.915	25	0.369	0.19744
Psychological well-being	1	0.422	35	0.676	0.13882
	2	0.955	27	0.348	0.35333
	3	0.846	25	0.406	0.36818

Table 10. Means and Standard Deviations of Variables at each time point (Experimental= E; Control= C)

Variable	Range	Alpha Level	Mean(SD) Time point 1	Mean (SD) Time point 2	Mean (SD) Time point 3
Psychological well-being	1-7	0.82-0.93	*E 5.32 (0.89)*	*E 5.32 (1.15)*	*E 5.76 (1.33)*
			C 5.45 (1.11)	C 5.70 (0.68)	C 5.85 (0.78)
Optimism	0-4	0.83-0.86	*E 2.92 (0.47)*	*E 2.52 (0.56)*	*E 2.72 (0.66)*
			C 3.09 (0.58)	C 2.67 (0.46)	C 2.81 (0.37)
Burnout	1-5	0.88-0.92	*E 2.28(0.69)*	*E 2.52 (0.67)*	*E 2.44 (0.68)*
			C 2.24 (0.63)	C 2.25 (0.43)	C 2.28 (0.76)
Positive Affect	1-5	0.72-0.77	*E 3.78(0.50)*	*E 3.77 (0.55)*	*E 3.97 (0.39)*
			C 3.90 (0.50)	C 3.85 (0.52)	C 3.96 (0.50)
Negative Affect	1-5	0.66-0.72	*E 2.36(0.46)*	*E 2.29 (0.63)*	*E 2.16 (0.44)*
			C 2.22 (0.48)	C 2.31 (0.39)	C 2.31 (0.39)

The means and standard deviations of the variables were examined across the three time points (Table 10). The means indicated how the variables changed in each group over the course of the study. The means of optimism further identified the trend occurring in the participants in which both groups experienced the highest level of optimism at the beginning of the study

experimental mean= 2.92, control mean= 3.09). The level of optimism in all participants dropped throughout the course of the study and never returned to baseline (Figure 1). However, the optimism levels did increase between time point two and three for both groups.

The means of the markers of psychological health (psychological well-being, positive affect, negative affect, and athlete burnout) were also examined (Table 10). The means identified how the markers of psychological health changed in each group. Psychological well-being and positive affect increased in both groups. Negative affect decreased in the experimental group as compared to the control group which experienced an increase in negative affect. Athlete burnout increased in both groups over the course of the study.

Additionally, five repeated measure ANOVA's were performed to identify differences in each study outcome variable (optimism, psychological well-being, positive affect, negative affect, and athlete burnout) by time points (first, second, and third) and by groups (experimental vs. control). There was a significant difference in optimism levels when comparing all participants at each time point ($F(2,25)=5.969$; $p=0.005$) with a large effect size of 0.193 (see Table 11). However, there were no significant differences in any of the other study outcomes variables at any of the time points when comparing the experimental and control group (see Table 12).

Table 11. Repeated Measures ANOVA by time points (all groups combined; N=27). *P<0.05 indicates significance.

Variables	DF	F-value	P-value sig.	Partial Eta Square
Athlete burnout	2	1.466	0.241	0.055
Positive affect	2	1.007	0.372	0.039
Negative affect	2	0.765	0.471	0.030
Optimism	2	5.969	0.005	0.193
Psychological well-being	2	1.519	0.229	0.057

Table 12. Repeated measures ANOVA by time point*group (Control= 12; Experimental; 15).

Variables	DF	F-value	P-value sig.	Partial Eta Square
Athlete burnout	2	0.183	0.834	0.007
Positive Affect	2	0.212	0.810	0.008
Negative affect	2	0.437	0.648	0.017
Optimism	2	0.063*	0.939	0.003
Psychological well-being	2	0.222	0.802	0.009

An exploratory post hoc test of the repeated measure ANOVA's indicated a significant change in optimism for all participants between the first and second testing session (p=0.007) and the first and third testing sessions (p=0.016). There was no significant difference in optimism between the second and third testing sessions (0.210) (see Table 13).

Table 13. Pairwise comparison for LOT measurement across the three testing time points for all participants (N=27) (optimism). *p<0.05 indicates significance.

Timepoints	Mean difference	Std. Error	P-value sig.	Lower bound	Upper bound
1-2	0.500	0.170	0.007*	0.150	0.850
1-3	0.316	0.123	0.016*	0.064	0.569
2-3	-0.184	0.143	0.210	-0.478	0.110

Trends in the data were also explored. Accordingly, there was not a significant change in optimism for each group; however, the data indicates a trend towards a significant difference in optimism between the two groups (See figure 1). When examining each group separately, the control group exhibited slightly greater levels of optimism at each of the time points as compared to the experimental group. The trend for optimism in both groups is represented by the athletes sampled reporting the highest optimism levels earlier in the semester and lowest around mid-semester. Although the athlete participant's optimism levels decrease around mid-semester, the

data suggests an increase in optimism towards the end of the semester, near the conclusion of both athletic and academic requirements for the semester and the season. However, the student-athlete's optimism never increased back to the baseline level.

Table 14. LOT analysis by groups across the three testing time points.

Group	Time point	Mean	Std. Error	Lower bound (95% CI)	Upper bound (95% CI)
Control	1	3.185	0.151	2.875	3.496
	2	2.674	0.157	2.351	2.997
	3	2.819	0.161	2.488	3.151
Experimental	1	2.994	0.135	2.717	3.272
	2	2.506	0.140	2.217	2.794
	3	2.728	0.144	2.431	3.024

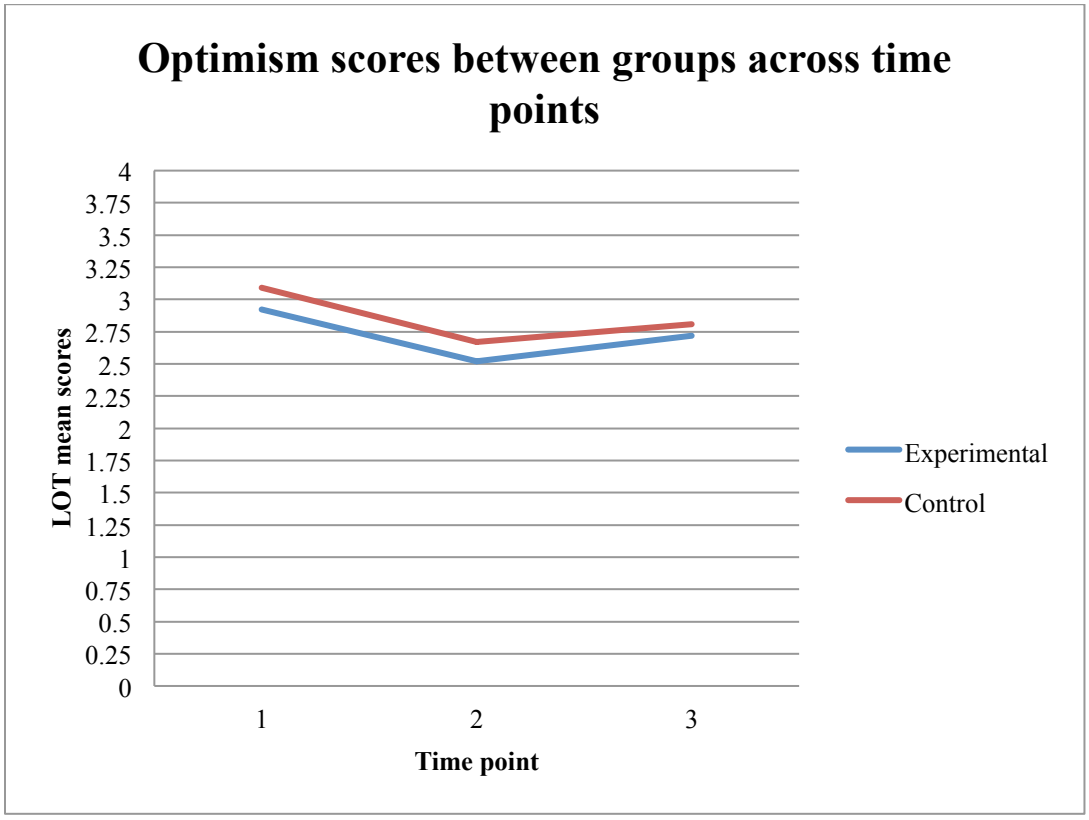

Figure 1. Optimism levels of each group throughout the three time points.

Discussion

The aim of this study was to examine the relationship between optimism and markers of psychological health (including psychological well-being, positive affect, negative affect, and athlete burnout). The secondary purpose was to explore if and to what degree collegiate athlete optimism could be manipulated with a motivational imagery intervention. Lastly, our final purpose was to identify how markers of psychological health are affected in collegiate athletes after a nine week motivational imagery intervention. The results of the current study have implications for the knowledge base on athlete psychological health and well-being as well as for sports medicine and sport psychological practice. Results and interpretations are outlined in greater detail below.

Results from all the participants indicated a significant positive correlation between optimism and adaptive markers of psychological well-being, except for positive affect. Specifically, a significant negative association was found between optimism and athlete burnout and negative affect. Gustafsson and Skoog identified similar relationships between optimism and athlete burnout (Gustafsson & Skoog, 2012). In addition, Gustafsson and colleagues found a positive correlation between athlete burnout and negative affect, which was also seen in our study (Gustafsson et al., 2013). These relationships also suggest negative psychological factors (athlete burnout and negative affect) are positively associated and more adaptive dispositional and psychological outcomes (optimism and psychological well-being) are positively associated with each other. These findings support our first hypothesis and are in line with previous research on psychological health (Gustafsson & Skoog, 2012). Future research would benefit from encouraging positive behaviors and methods focusing on optimism beyond imagery specifically, in order to examine how optimism and positive markers of psychological health

may change and decrease negative markers of psychological health. Such methods may include stress reduction exercises, positive self-talk, and promotion of social support. Methods focusing on encouraging positive behaviors could be easily incorporated into individual's daily lives and could have impact on multiple outcomes of psychological health, which could lead to improvements in their daily function and sports performance.

Moreover, our study examined how an imagery intervention would affect optimism levels in student-athletes over the course of a nine week study. Study results indicated no significant increase in optimism when comparing the groups separately (experimental vs. control). However, when analyzing the change in optimism of all of the participants by testing sessions, a trend was revealed for a significant change in optimism throughout the study time frame. This trend suggested athlete populations begin with high optimism levels that decrease during the mid-semester or mid-season time point followed by an increase in optimism at the end of the semester or season. However, the student-athlete's optimism did not return to baseline level over the course of the semester. The data suggests that athlete's possess the highest levels of optimism at the beginning of the semester or season. Since this effect was seen in both the experimental group and the control group, the study is inconclusive as to whether or not the increases in optimism were due to the current study or circumstances occurring in the student-athletes lives (i.e. the end of the competitive season, the end of the semester with academics). In addition, the changes in optimism may be the natural trend of optimism that a student-athlete experiences throughout a semester. The control participants possessed great levels of optimism (as identified by exploring trends) throughout the study as compared to the experimental group. This could suggest relatively ubiquitous trends in athlete positivity and optimism over the course of the semester may exist. Accordingly, such broad trends have had some effect on optimism

levels of athletes in this study. This concept could also have implications for future research and practice attempting to promote athlete optimism. Peters et al. suggested that high levels of optimism lead to less of an increase in positive expectancies for the future due to a ceiling effect (Peters, Flink, Boersma, & Linton, 2010). A ceiling effect indicates an individual begins with high levels of a certain marker, such as optimism, which leaves little to no room for improvement (Peters et al., 2010). Our study used student-athletes as participants and athletes have been shown higher optimism levels as compared to non-athlete college students (Lipowski, 2012). Therefore, the degree of potential increase in optimism for study participants may have been limited.

The data indicated the control participants possessed higher levels of optimism throughout the entire study as compared to the experimental participants; however the differences in means were not greater than 0.20 on a 5-point measurement scale and the changes between time points and differences between groups were not statistically significant. All participants began with relatively high levels of optimism at the beginning of the study. The optimism levels decreased at the mid-point testing of the study and increased again at the end of the study. This information suggests all participants had decreased optimism during the mid-point of the fall semester. The small variations of optimism throughout the study could be due to the increased stresses of academics (i.e. midterms) and sports. Increases in optimism levels at the end of the semester may be due to the excitement of the conclusion of the academic semester or sports season, however the results are speculative. Therefore, further research may examine various stressors student-athletes encounter throughout the semester and how they may affect optimism levels.

Alternately, other studies in the past have found changes in optimism through the use of an intervention (Blackwell et al., 2013; Meevissen et al., 2011b). Meevissen et al. found the "best possible self" intervention to be successful in increasing levels of optimism. Blackwell et al. identified the vividness of imagery as a factor affecting how imagery changes optimism. They indicated elevated vividness of imagery could lead to higher levels of optimism (Blackwell et al., 2013). Cumulatively, the current study provided information about the importance of vividness and controllability during an imagery intervention during each testing session. In addition, the researchers had practice sessions of imagery and tips for improving vividness and controllability during the imagery lectures at each testing session. Compared to past studies, the current study utilized a small sample size and utilized a unique (as compared to previous studies) motivational imagery intervention. The variation in results could be due to all of these factors, in addition to the possible higher optimism levels of athlete sampled at the beginning of the study.

Although our study indicated statistically significant changes in optimism across the three testing sessions when including all participants, the clinical significance of these findings merits discussion. Although the results were statistically significant and possessed a moderate to large effect size, both the control and experimental group experienced similar trends in optimism regardless to exposure to the intervention. These findings could be explained by a variety of methodological decisions. For example, the changes in optimism levels with all the participants could be accounted for by the positivity talk given to every participant at each testing session rather than the imagery intervention. Thus, the control group may be considered more of an "active" control group. Another study completed by Zeidan and colleagues used a similar method to examine how a mindfulness meditation intervention affects mood using an active and experimental group (Zeidan, Johnson, Diamond, David, & Goodlkasian, 2010). They found no

differences in self-report mood variables between their experimental and active control groups and further suggested the lack of difference between the two groups could be due to the active nature of the control group (Zeidan et al., 2010). Similarly, the intervention design for the current study may have also been characterized by an active control group and explain the study findings in relation to optimism. In the current study, the control group received a positivity lecture due to ethical concerns of them not being involved at all in the study and receiving no beneficial information about positivity. Future research should consider having more than two groups, including a true control group, active control group (receives the positivity lecture), and an imagery intervention group in order to identify if and to what degree a positivity lecture effects optimism and markers of psychological health as compared to an imagery intervention.

Our study also examined potential changes in psychological well-being, positive affect, negative affect, and athlete burnout following experimental group exposure to an optimism-focused imagery intervention. Our results indicated no significant change in psychological well-being, positive affect, negative affect, and/or athlete burnout for the full sample or by group analysis. Therefore, the intervention had no significant effect on the positive psychological outcomes of athlete's exposure to our motivational imagery training program. This finding contradicted the researcher's third study hypothesis relative to positive markers of psychological health. However, there was no significant change in athlete burnout and negative affect, which partially supported the third hypothesis of the researcher relative to negative markers of psychological health. Moreover, when examining the means of negative affect across the three time points, the experimental group experienced a decrease in negative affect throughout the study. This (non-significant) change is important because the researchers expected the negative markers of psychological health (negative affect and athlete burnout) to increase over the course

of the semester. Thus, the researchers believed the imagery intervention would prevent these factors from increasing and result in no change.

A study completed by Peters et al. used a similar imagery intervention with college students that focused on imagining the participant's "best possible self." However in this study, the "best possible self" intervention caused a significant increase in positive affect and a decrease in negative affect (Peters et al., 2010). A study completed by Sheldon and Lyubomirsky also examined the influence of "best possible self" imagery intervention on positive affect and negative affect (Lazarus & Folkman, 1984; M. & Lyubomirsky, 2007). They found the "best possible self" intervention group to experience increases in positive affect and decreases in negative affect as compared to controls (Lazarus & Folkman, 1984; M. & Lyubomirsky, 2007). Thus, multiple studies have shown some varying results when examining how markers of psychological health may be influenced with an imagery intervention. These variations may be due to the type of imagery interventions utilized across studies. Unlike previous studies, the current study used a general motivational imagery intervention, focusing on optimism and positive thoughts, as compared to the other research studies encouraging participants to focus on their "best possible self." The "best possible self" imagery requires the individuals to visualize what they perceive to be the best possible situations and outcomes in their life, which encourages thinking about what they want most in their life, whereas the motivational imagery intervention depends on the individual's ability to think positively. Thus, if the student-athlete has difficulty thinking positively and optimistically then they may not experience as many psychological benefits as compared to the "best possible self" imagery, which may be easier to complete. In addition to the differentiation in methods, other research studies have had larger study samples

and use the general population as compared to our limited number of participants and athlete population.

This current study provides exploratory information about the use and feasibility of imagery interventions in an athlete population. Building on the current imagery intervention which is adapted to a collegiate athlete population, future studies may design and assess beneficial imagery techniques for athlete populations to improve markers of psychological health and imagery. From the standpoint of clinicians, past research has found athletic trainers to have positive attitudes towards the use of psychological training methods, such as imagery, positive self-talk, and goal setting, to be helpful for athlete injury rehabilitation (Hamson-Utley, Martin, & Walters, 2008). Alternatively, Hamson-Utley et al. identified that some athletic trainers are hesitate to integrate imagery into their methods of treatment due to lack of formal training. Thus, the encouragement of proper education and training with imagery interventions would be beneficial for future practice. Along with this clinical practice aim, further research is needed which identifies what type(s) of imagery intervention would be the most beneficial for the student-athletes (i.e. optimism-focused imagery, "best possible self" imagery, general motivational imagery, sports performance imagery). The parallel use of imagery and other psychological skill techniques within sports medicine rehabilitation settings is another potentially fruitful area for clinical research and practice going forward. Such efforts may facilitate larger changes in athlete psychological outcomes than those observed in the current study.

The current study identified further practical clinical applications. The primary researcher completed a clinical journal which recorded notes on the practicality and ease of implementing this intervention with collegiate athlete participants. This practice identified several factors which influenced the implementation of this intervention. First, education about

psychological health and imagery interventions may impact the clinician's attitude towards the use of psychological intervention and treatments with their athletes. For example, if the clinician does not have a good understanding of and knowledge background about collegiate athlete psychological health he or she may be hesitate to try to incorporate psychological interventions (i.e. imagery) into his or her sports medicine practice. In addition, clinical experience with these interventions could help improve the ease of incorporating them. The current imagery intervention also did not require more than five minutes to complete, therefore, making it an easy intervention to incorporate into an athlete's daily regimen and more advantageous clinically. As a result, it represents a template program of athlete adherence to an imagery program from a time management standpoint. Alternatively, if clinicians are still hesitant to the use of imagery interventions in their clinical practice, research indicates encouraging positive and optimistic attitudes with their athletes may have positive benefits to their psychological health, including optimism. For example, clinicians could discuss with their sports psychologist on the proper way to address positivity with student-athletes and/or receive further education about positivity and optimism via continuing education experiences.

Despite its conceptual and clinical impact, there are several limitations to this study. Our study included a relatively small athlete sample, which resulted in limited power to assess significant effects. Participants recruitment was difficult for this study due to its dependence on Division I student-athletes to volunteer participation. In addition, between recruitment, completion of the consent form and patient history questionnaire, and completion of the testing sessions, there was a relatively high rate of potential participant attrition. Moreover, there was an attrition of nine individuals between the first testing session and mid-point testing session. Therefore, it may be beneficial for future studies to give the option of completing the mid-point

testing session on-line or in person. To improve recruitment and retention of participants in future studies, researchers may want to investigate the possibility of providing participation incentives. Future studies would benefit from obtaining a larger sample size to identify significant changes in optimism, psychological well-being, positive affect, negative affect, and athlete burnout.

In addition, our study did not examine how stress affected these markers of psychological health and optimism over the course of the study. The trend of optimism occurring in our participants could have also been influenced by stress. Therefore, future research should examine how stress affects psychological health in collegiate athletes.

Another limitation in the current study was the inclusion of UNC at Chapel Hill varsity and club sport athletes. Future studies should observe athletes at other Division I schools and various levels, including different collegiate levels (i.e. Division I, II, III, NAIA), various ages (i.e. high school, collegiate, post-collegiate), and developmental competitive levels (i.e. adolescent club, collegiate varsity, collegiate club, professional). Beyond enhancing study generalizability, athletes at other competition levels may be more interested and receptive to the intervention and have an easier time completing the task. In the current study, the researcher had some difficulty with keeping the participants interested in the study and making sure they were receptive to the imagery intervention.

The current study also consisted of two groups of participants, including a control and experimental group. Although the control group did not complete the imagery task, they received a positivity lecture at each of the testing sessions. Throughout the study, both groups exhibited similar patterns relative to optimism change which could be attributed to positivity

talked presented to the control participants. Thus, they may have been a more "active" control group as compared to a true control group. As a result, future research may benefit from having an experimental group, "active" control group, and true control group that receives no information about the imagery intervention or the positivity lecture to recognize more accurate comparisons of the groups. A study possessing these three groups would identify how and to what degree imagery and positivity would affect optimism and markers of psychological health since they will be compared to each other and a control group.

Although there were several limitations to this study, this study offered meaningful contribution to sports medicine and sports psychology knowledge bases. The results of the study further indicate that optimism has the potential to change over the course of a semester. Although the study did not specifically support the use of the present imagery to improve optimism or psychological health of student-athletes, the study did not indicate any negative effects of providing the intervention relative to athlete optimism and psychological health. Moreover, the study did support the feasibility of incorporating imagery into a student-athletes competitive season experience. In addition, the study identified relationships among several psychological health factors, including optimism, psychological well-being, negative affect, and athlete burnout. The study further identified I-PANAS-SF, ABQ, LOT, SWLS as reliable measures study variables in a collegiate population. Cumulatively, this current study is an important exploratory effort which provides unique information about athlete psychological health outcomes as well as identifies and assesses imagery as a potential intervention method for improving optimism and markers of psychological health.

APPENDIX A: PATIENT HISTORY QUESTIONNAIRE

Patient History Questionnaire

Please respond to each question to the best of your ability. All your answers with remain confidential at all times.

General history:

Name:_____

Age:_____ Gender: Male Female Race:_____

Sport:_____ Level of sport: Varsity Club

Position in sport:_____

Total years of experience in that particular sport:_____

Years of experience in that particular sport at a collegiate level (include redshirting and competing): _____

History of injury:

Do you currently have an injury that limits your participation in sport? Yes No

If yes, what is the injury? _____

How long have you had this injury? _____

College history:

What is your current academic status? Freshman Sophomore Junior Senior

5th year senior 6th year senior Graduate student

What is your current semester load? (i.e. 12 hours, 14 hours, etc.) _____

Psychology:

Are you currently seeing a clinical psychologist or mental health professional? Yes No

If yes, are you receiving any of the following? (Check all that apply)

Mediation Thought stopping Imagery Motivational Other (specify)

How often are you performing this intervention? Daily Weekly Monthly

What is the purpose of this intervention with the clinical or sports psychologist?

Emotional regulation/stress management

Sports performance enhancement

Clinical mental health issue or disorder (i.e. depression, anxiety, mood disorder, eating disorder))

If you have been seen for clinical mental health issue or disorder, have you been clinically diagnosed by a doctor for a psychological disorder (i.e. depression, anxiety, mood disorder, schizophrenia)? Yes No

Are you doing individual or group therapy with the clinical or sports psychologist?

Group Individual

I have answered all questions to the best of my ability.

_____	_____	_____
Name	**Signature**	**Date**

APPENDIX B: INTERNATIONAL POSITIVE AFFECT AND NEGATIVE AFFECT SCHEDULE-SHORT FORM

The International Positive and Negative Affect Schedule Short Form (I-PANAS-SF) Question, Measure, and Item Order

Question: Thinking about yourself and how you normally feel, to what extent do you generally feel:

Items in order:

1. Upset	____	6. Nervous	____
2. Hostile	____	7. Determined	____
3. Alert	____	8. Attentive	____
4. Ashamed	____	9. Afraid	____
5. Inspired	____	10. Active	____

Interval measure: (*never)* 1 2 3 4 5 (*always)*

APPENDIX C: LIFE ORIENTATION TEST (LOT)

Life Orientation Test (LOT)

Instructions:

Please answer the following questions about yourself by indicating the extent of your agreement using the following scale:

(0)= strongly disagree

(1)= disagree

(2)= neutral

(3)= agree

(4)= strongly agree

Be as honest as you can throughout, and try not to let your response to one question influence your response to other questions. There are no right or wrong answers.

_____ 1) In uncertain times, I usually expect the best.

_____ 2) It's easy for me to relax.

_____ 3) If something can go wrong for me it will.

_____ 4) I always look on the bright side of things.

_____ 5) I'm always optimistic about my future.

_____ 6) I enjoy my friends a lot.

_____ 7) It's important for me to keep busy.

_____ 8) I hardly ever expect things to go my way.

_____ 9) Things never work out the way I want them to.

_____ 10) I don't get upset too easily.

_____ 11) I'm a believer in the idea that "every cloud has a silver lining."

_____ 12) I rarely count on good things happening to me.

Scheier, M.F. & Carver, C.S. (1985). Optimism, coping, and health: Assessment and implications of generalized outcome expectancies. Health Psychology. 5, 219-247

APPENDIX D: SATISFACTION WITH LIFE SCALE (SWLS)

The Satisfaction with Life Scale

By Ed Diener, Ph.D.

DIRECTIONS: Below are five statements with which you may agree or disagree. Using the 1-7 scale below, indicate your agreement with each item by placing the appropriate number in the line preceding that item. Please be open and honest in your responding.

1 = Strongly Disagree
2 = Disagree
3 = Slightly Disagree
4 = Neither Agree or Disagree
5 = Slightly Agree
6 = Agree
7 = Strongly Agree

_____1. In most ways my life is close to my ideal.
_____2. The conditions of my life are excellent.
_____3. I am satisfied with life.
_____4. So far I have gotten the important things I want in life.
_____5. If I could live my life over, I would change almost nothing.

APPENDIX E: MOTIVATIONAL IMAGERY ABILITY MEASURE FOR SPORT

Motivational Imagery Ability Measure for Sport
Age: _____ Gender: _____
Primary Sport: (indicate one only) _____

Current Level of Participation in Primary Sport: (check appropriate classification)
Recreational/Club Varsity/Provincial National International

This questionnaire involves creating images of eight situations. After you image each scene, you will rate the imagery on two scales. Your ratings will be made on a 7-point scale, where 1 indicates difficulty forming the image or no emotional experience, and 7 is an easily formed image or a very strong emotional experience. Images that fall between these two extremes should be rated accordingly along the scale. There are no right or wrong ratings. Be as accurate as possible and take as long as you feel necessary to arrive at the proper ratings for each scene.

The two scales are:
emotional – emotions experienced while imaging the scene
ease – the ease of forming the image

Scene 1 (MG-M)
STEP 1 (read): Imagine you are participating in an important competition for your sport, you feel very fatigued physically and mentally, but can imagine yourself overcoming these feelings and giving your full effort. Your muscles feel heavy and tired, but you feel yourself starting to become more energized. See yourself pick up the pace and perform with extra effort. Notice how your mood lifts and you observe more of your surroundings.

STEP 2: Now create and experience your image of the scene in your mind.

STEP 3: Next, complete the two scales below.
1. How strong was your emotional experience created by the image?
No emotion (1) Very strong emotion (7)
1 2 3 4 5 6 7
2. How easy was it to form the image?
Not at all easy to form (1) Very easy to form (7)
1 2 3 4 5 6 7

Scene 2 (MG-A)
STEP 1 (read): Imagine yourself about to begin a competition in your sport. As you finish your preparations in the final few minutes before the competition begins you notice the feeling of some ‘‘butterflies in your stomach’’. You notice your palms are a bit sweaty and your heart is beating a little quickly. You know these symptoms indicate that you are a little bit excited, this is good, and that you are ready to compete.

STEP 2: Now create and experience your image of the scene in your mind.

STEP 3: Next, complete the two scales below.

1. How strong was your emotional experience created by the image?
No emotion (1) Very strong emotion (7)
1 2 3 4 5 6 7

2. How easy was it to form the image?
Not at all easy to form (1) Very easy to form (7)
1 2 3 4 5 6 7

Scene 3 (MG-M)
STEP 1 (read): Imagine following spring break you are having a difficult time getting back into the rhythm of class. You have been oversleeping, making poor grades, and haven't been able to concentrate. You are feeling overwhelmed as you sit in class. Then you clear your mind and let that mental tension leave you. You return your focus to the lecture and feel more relaxed as you grasp an understanding about what your professor is discussing. You look around and see your classmates and professor and feel calm again.

STEP 2: Now create and experience your image of the scene in your mind.

STEP 3: Next, complete the two scales below.
I1. How strong was your emotional experience created by the image?
No emotion (1) Very strong emotion (7)
1 2 3 4 5 6 7
2. How easy was it to form the image?
Not at all easy to form (1) Very easy to form (7)
1 2 3 4 5 6 7

Scene 4 (MG-M)
STEP 1 (read): Imagine you are answering a problem in your math class that is very difficult. Notice your frustration as you attempt to do the problem properly. Now imagine yourself starting to complete the problem correctly. Notice your satisfaction as you see and feel yourself going through the proper steps to answer the math problem.

STEP 2: Now create and experience your image of the scene in your mind.

STEP 3: Next, complete the two scales below.
1. How strong was your emotional experience created by the image?
No emotion (1) Very strong emotion (7)
1 2 3 4 5 6 7

2. How easy was it to form the image?
Not at all easy to form (1) Very easy (7)
1 2 3 4 5 6 7

Scene 5 (MG-A)
STEP 1 (read): Imagine yourself going to a music concert with friends. As you notice the sites and sounds at the concert you feel yourself becoming excited. Your heart rate increases as you anticipate the start of the concert. You're feeling ''psyched up'' and ready for a great night with friends.

STEP 2: Now create and experience your image of the scene in your mind.

STEP 3: Next, complete the two scales below.
1. How strong was your emotional experience created by the image?
No emotion (1) Very strong emotion (7)
1 2 3 4 5 6 7

2. How easy was it to form the image?
Not at all easy to form (1) Very easy to form (7)
1 2 3 4 5 6 7

Scene 6 (MG-A)
STEP 1 (read): Imagine you are about to take a nap. You've just finished a fulfilling lunch with your friends and walked by to your dorm. You stomach fills really full and you suddenly become very sleepy as you lay down on your comfy bed. You can feel your heart rate slow down. Your breathing is deep and rhythmical. Mentally you feel at ease and your mind is clear. See yourself drifting to sleep.

STEP 2: Now create and experience your image of the scene in your mind.

STEP 3: Next, complete the two scales below.
1. How strong was your emotional experience created by the image?
No emotion (1) Very strong emotion (7)
1 2 3 4 5 6 7

2. How easy was it to form the image?
Not at all easy to form (1) Very easy to form (7)
1 2 3 4 5 6 7

Scene 7 (MG-A)
STEP 1 (read): Imagine yourself making a final presentation in class. You feel as though your focus is at an optimal level. You sense excitement and anticipation within yourself, yet feel calm and in control.

STEP 2: Now create and experience your image of the scene in your mind.

STEP 3: Next, complete the two scales below.
1. How strong was your emotional experience created by the image?
No emotion (1) Very strong emotion (7)

1 2 3 4 5 6 7

2. How easy was it to form the image?
Not at all easy to form (1) Very easy to form (7)
1 2 3 4 5 6 7

Scene 8 (MG-M)
STEP 1 (read): Imagine yourself getting all dressed up in your fancy dress or suit for an awards ceremony. You feel spectacular and look like a movie star. As you look around you see your friends and slowly make your way to take a picture. You see the flashes of the cameras and feel desirable. See yourself wrapping an arm around your friend as you both smile big for a picture. You feel great and on top of the world.

STEP 2: Now create and experience your image of the scene in your mind.

STEP 3: Next, complete the two scales below.
1. How strong was your emotional experience created by the image?
No emotion (1) Very strong emotion (7)
1 2 3 4 5 6 7

2. How easy was it to form the image?
Not at all easy to form (1) Very easy to form (7)
1 2 3 4 5 6 7

APPENDIX F: EXPERIMENTAL GROUP END OF STUDY QUESTIONNAIRE

This is a brief end of study questionnaire. This questionnaire should take approximately five minutes to complete. Please answer the following questions as honestly as possible.

Name:_____

Sport:_____

Answer the following questions using the five point Likert scale below:

1	2	3	4	5
Very slightly/not at all	A Little	Moderately	Quite a Bit	Extremely

On a daily basis did the imagery techniques affect your health and well-being positively? _____

Overall, did the imagery techniques affect your health and well-being positively? _____

Did you find the imagery techniques helpful? _____

Did you find the journal entries helpful?_____

Did you find the positivity lectures helpful? _____

Did you have issues with the imagery techniques? _____

If so, what were your issues? (Specifically write them out)

_____

Did you have issues with the journal entries? _____

If so, what were your issues? (Specifically write them out)

_____

Will you use the imagery techniques in the future? Yes No Maybe

Will you use the journal entries in the future? Yes No Maybe

Did you tell anyone in the control group about the imagery intervention? Yes No

Comments:

APPENDIX G: CONTROL GROUP END OF STUDY QUESTIONNAIRE

This is a brief end of study questionnaire. This questionnaire should take approximately five minutes to complete. Please answer the following questions as honestly as possible.

Name:_____

Sport:_____

Answer the following questions using the five point Likert scale below:

1	2	3	4	5
Very slightly/not at all	A Little	Moderately	Quite a Bit	Extremely

Did you find the journaling helpful? _____

Did you find the positivity lectures helpful? _____

Did you try to incorporate positivity more into your daily life?_____

Did you look up any positivity interventions after the lecture? _____

If so, did you start using any of the positivity interventions you found? Yes No

If so, which positivity interventions did you use? (Specifically write them out)

_____

Did you hear about the imagery intervention during the course of this study? Yes No

Did you start using the imagery intervention during the course of this study? Yes No

If yes, before or after the mid-point testing? Before After

Comments:

APPENDIX H: ATHLETE BURNOUT QUESTIONNAIRE

Athlete Burnout Questionnaire

Please read each statement carefully and decide if you ever feel this way about your current sport participation. Your current sport participation includes all the training you have completed during this season. Please indicate how often you have had this feeling or thought this season by circling a number 1 to 5, where 1 means "I almost never feel this way" and 5 means "I feel that way most of the time." There are no right or wrong answers, so please answer each question as honestly as you can. Please make sure you answer all items. If you have any questions, feel free to ask.

How often do you feel this way?

Almost never	Rarely	Sometimes	Frequently	Almost always
1	2	3	4	5

1. I'm accomplishing many worthwhile things in my sport
2. I feel so tired from my training that I have trouble finding energy to do other things
3. The effort I spend in my sport would be better spent doing other things
4. I feel overly tired from my sport participation
5. I am not achieving much in my sport
6. I don't care as much about my sport performance as I used to
7. I am not performing up to my ability in my sport
8. I feel "wiped out" from my sport
9. I'm not into my sport like I used to be
10. I feel physically worn out from my sport
11. I feel less concerned about being successful in my sport than I used to
12. I am exhausted by the mental and physical demands of my sport
13. It seems that no matter what I do, I don't perform as well as I should
14. I feel successful at my sport
15. I have negative feelings toward my sport

Reference: Raedeke, T.D. & Smith, A.L. The Athlete Burnout Questionnaire Manual. Morgantown, WV. 2009: 65-69.

APPENDIX I: JOURNAL ENTRY FOR EXPERIMENTAL GROUP

Good afternoon! You are about to complete a journal entry for this study. During this study, you are responsible for completing this journal entry 3 times per week. The journal entries should take you approximately 5-10 minutes to complete. Please answer the following questions to the best of your ability.

How often have you been completing the imagery task?

A. Daily
B. 5-7 times per week
C. 3-4 times per week
D. 2-3 times per week
E. Once a week
F. Never

How long does your imagery session last?

How do you feel following your imagery session?

A. More positive
B. More negative
C. No change

What do you imagine during your imagery session?

When do you complete your imagery sessions?

A. Morning
B. Before/after practice
C. Before/after class
D. At night before bed
E. I have not been doing my imagery sessions

List three words to describe how you have felt today.

APPENDIX J: CONTROL GROUP JOURNAL ENTRY

Good afternoon! You are about to complete a journal entry for this study. During this study, you are responsible for completing this journal entry 3 times per week. The journal entries should take you approximately 5 minutes to complete. Please answer the following questions to the best of your ability.

List three words to describe how you have felt today.

APPENDIX K: SCRIPTS FOR STUDY

Brief introduction (both experimental and control groups):

Good afternoon everyone! You are here today to participate in a study about life experiences of a college athlete. Today, you will complete a life experiences questionnaire. We will also explain how you will complete the on-line journal entries. Your participation in this study is completely voluntary and you may discontinue participation at any time.

Everyone please open your UNC email. You should have an email from me (lmccarn@live.unc.edu) with a link to complete the life experiences questionnaire. Please click on the blue Survey link toward the bottom of the email and complete the questionnaires at this time. This should take you no longer than 10-15 minutes. If you have any questions or complications while completing the questionnaire, please raise your hand and I will come to you.

(Once everyone has completed the questionnaires, will discuss the journal entries.)

Journal entries:

Control group: Every week you will be responsible for completing three journal entries. Three times a week you will receive an email similar to the one with the behavioral questionnaires. Again, you will find a similar blue survey link toward the bottom of these emails. Each time you will click on the link to complete your journal entry. Once you submit the journal, please delete the email so you do not confuse it with subsequent mailings. The link is different every time and once you submit a journal, you cannot use the same link again. If you accidently delete the email before you submit the associated journal, please email me and I can send you another link. The journal entries will include short answer; fill in the blank, and multiple choice questions. They will focus on your psychological health and general well-being.). For the short answer question, you should focus on talking about how you have felt lately, emotionally and psychologically. For example, if you have noticed you have felt happier or if you feel like you have felt down lately. Do not focus on your sport performance or competitions. Each entry should take you approximately 5 minutes to complete. If you have any questions about any of the journal entries, feel free to contact me via my email.

Experimental group: Every week you will be responsible for completing three journal entries. Three times a week you will receive an email similar to the one with the behavioral questionnaires. Again, you will find a similar blue survey link toward the bottom of these emails. Each time you will click on the link to complete your journal entry. Once you submit the journal, please delete the email so you do not confuse it with subsequent mailings. The link is different every time and once you submit a journal, you cannot use the same link again. If you

accidently delete the email before you submit the associated journal, please email me and I can send you another link. The journal entries will include short answer; fill in the blank, and multiple choice questions. They will focus on your psychological health and motivational imagery sessions. Some of the questions will specifically ask you about your imagery sessions (such as when, how long, and what you imagine during them). For the short answer question, you should focus on talking about how you have felt lately, emotionally and psychologically. For example, if you have noticed you have felt happier or if you feel like you have felt down lately. Do not focus on your sport performance or competitions. The multiple choice questions will focus on the imagery task you have been completely. You should only select one answer for these questions. Each entry should take you approximately 5 minutes to complete. If you have any questions about any of the journal entries, feel free to contact me via my email.

Positivity lecture (for both control and intervention groups):

Now, we are going to talk briefly about the importance of positivity and positive emotions on life.

Positive emotions include happiness, pride, relief, hope, love, and compassion (Lazarus, 1993). Research suggests emotions may be shaped by coping and psychological stress by influencing the relationship the person has with others and their environment (Lazarus, 1993). Therefore, identifying a way to cope and deal with psychological stress, such as thinking positively may help improve a person's emotions.

Positive emotions have been shown to have positive effects mentally, physically, psychologically, and socially. Positive emotions may help improve attention, cognitive abilities, social interactions, and general health (Fredrickson, 1998). As an athlete, it is optimal for you maintain all of these factors affected by positive health. You will want to be able to function at the highest level mentally in your sport, in addition to in the classroom, because you are a STUDENT-athlete. Also, positive emotions have been specifically shown to be beneficial with competence, purpose in life, optimism, self-acceptance, relationships, and mental health (Fredrickson, 2013).

Positivity has been suggested to be a predictor of longevity, mental aging, and resistance against illness (Seligman, 2008). As you continue to age throughout your life, you want your body to be strong against the physical and mental challenges it faces. Remaining positive throughout your life may help you fight those obstacles and continue to push yourself.

As a student, positivity could help improve your outlook on academics. For example, when preparing for a presentation, believing that you will do well and thinking positively about the situation may help you complete it with more ease and confidence. In addition, when trying to

meet deadlines, remaining hopeful and confident about completing your classwork may help improve your point of view about school.

As an athlete, positivity could help improve your attitude about your performance and develop your skills. Positivity could help an athlete remain confident following injuries and poor performances. When an athlete sustains an injury, it could affect them psychologically. Therefore, if you can remain positive, you may have a better outlook about rehabbing and returning to activity. In addition, every athlete experiences days where they do not have their best performance. However, it would be more beneficial for an athlete remain positive and think about the ways to improve their skills as compared to being negative and letting it keep them down.

Past research has shown athletes possessing "positivity" or positive self-concepts exhibited higher levels of mental toughness, constancy, control, and confidence as compared to those who possessed negative self-concepts (Meggs, 2013). These are all important factors that may affect an athlete as a whole, psychologically and physically. As an athlete it is important to be mentally tough to overcome the multitude of challenges you face. Mental toughness refers to your self-belief, faith, and ability to cope with challenges (Nicholls, 2008). You may not always perform well in a competition, but you have to be mentally tough so you can rationalize the situation and know that you will do better next time. Also, you want to be constant with everything you do, whether it is in class or in your sport. Lastly, when you're positive you exhibit more confidence. Confidence helps you know that you can be successful with the challenges you face. If you have a test in class and you are confident that you studied enough, you will feel better about taking the test. If you are about to compete in a competition and you are confident in your skills and know you have been practicing a lot, don't you feel better about competing against the other team?

By incorporating more positive emotions into your life, you may experience better general health and overall well-being. Also, you may feel better physically and mentally.

Does anyone have any questions about positivity?

Control group: Thank you for your participation. Throughout the next nine weeks, I would like you to complete three journal entries each week pertaining to your psychological health and well-being. These journal entries will involve some of these concepts over the course of your season to help gain a better understanding of factors contributing to psychological health. You can complete these on your own time. You will receive these journal entries via email, therefore, it is important for you to check your email daily. You will have 48 hours to complete these journal entries. If you do not complete the journal entry in one sitting, you may go back and finish it later by clicking on the link provided in the email. Thus, it is important for you to NOT delete the email with the journal entry link until you have submitted it. We will meet again

during the 5th week and again at the end of the study in 9 weeks. If you have any questions, please feel free to contact me through my email. Thank you again, and have a nice day!

Intervention group with receive lecture on imagery intervention.

Imagery intervention:

For this study, you will be asked to complete a 5 minute motivational imagery session daily. You will be able to complete this imagery task on your own time. However, you need to do the imagery task when you are in a quiet location and when you can focus. These sessions should not be completed during class, practice, or competitions. During these imagery sessions you should focus on your overall life (including academics, social, sports, etc.).

Imagery is the process of generating positive thoughts, controlling those thoughts, and vividly imaging positive future events.

Imagery can be viewed as internal and external. Internal imagery is when you are imagining something from your own point of view. For example, like playing video games. External imagery is when you are imagining a scene, but you are viewing your body completing the action. For example, like in a movie when someone "dies" and looks down on themselves from above.

There are two key components for effective imagery sessions: controllability and vividness. Controllability refers to your ability to manipulate images. Vividness refers to how detailed the image is.

Past studies have shown imagery to be beneficial for overall psychological well-being (Black et. al 2013, Meevisen 2011). In addition, imagery has been used for performance and motivational purposes in athletic settings.

There are also several other benefits to using imagery as a psychological tool including:

1. It is a low cost intervention that requires no extra machinery.
2. It is an intervention that does not require a large amount of physical effort.
3. It is a very low-risk intervention.
4. Many athletes and individuals find it to be fun or enjoyable experience.

For this study, we will focus on using imagery as a tool to improve your general health. When you complete these imagery tasks you should focus on your emotions and the feelings you experience in everyday life events (including in your social life, with academics, and in sports). However, these imagery sessions should not focus on sports performance. This task is not being

used to target your performance and ability to complete a skill in sport. You should focus on the emotions and feelings you get from these experiences.

Now that you know a little more about what imagery is, we are going to walk through a motivational imagery practice session. This session will demonstrate how you should complete the imagery task. If you have any questions, please raise your hand and I will come to you.

Imagery session:

Now I want you to get in a comfortable position, close your eyes and relax. You may put your head down on the desk or sit on the floor if you find that more comfortable. Once you find a comfortable position we will begin.

Imagery task 1 (general everyday life):
Start with an image of walking around campus. See yourself passing by the Old Well as you walk towards the pit. Feel your legs and feet walking across the bricks of the sidewalk. Hear the splash of water in the puddles from yesterday's rain. Feel the sunshine peak through the trees as you walk across the cross walk. Concentrate on how you are feeling: you feel excitement and happiness because it is finally Friday. You take a breath in and feel the relaxation as you have just finished your last class for the day. When people look at you, they see an outgoing, confident, happy person. Now think about how it would feel if the rest of your day went really well. Feel the excitement for the rest of your day. Now take these feelings and intensify them, that is, feel the same positive feelings but make them stronger. Feel yourself getting more excited and happy. You know in your mind that you will have a positive, great day with every encounter. Let yourself feel the pleasure, the joy, and the happiness. The better you can let yourself feel these sensations of satisfaction, the more you will feel happy with everything you do today. Feel the smile grow across your face because you know the rest of your Friday afternoon will be great. Other people can see the cheerfulness in you. Continue this image; as you breathe in, feel the positivity. Focus on your body: it's comfortable, relaxed and balanced. Think about the sensations you feel as you continue to walk to the pit: you feel great and alive.

(Does anyone have any questions following this imagery session? We're you able to visualize and feel everything? The Old Well? The sunshine? The happiness?)

Imagery task 2 (class/academics setting):
Start with an image of walking into your classroom. See yourself walking toward your seat. Feel you're legs and body sit down into your chair. You can feel the cold metal as you sit down into the hard desk. Concentrate on how your body is feeling: you feel energized and awake; you can feel the focus and desire to learn. When people look at you, they see a confident student. Now think about how it would feel if your professor handed back your test from last week and you see you did very well. Feel the crinkles in the paper; see the grade you hoped for. See yourself

clinch your fist as you say "yesss" under your breath. Feel the sense of accomplishment, the feelings of confidence, satisfaction, pride, and how all your studying paid off. The feeling that you can be successful in this class. Now take these feelings and intensify them, that is, feel the same positive feelings but make them stronger. Feel yourself getting more confident. Feel yourself sit up tall in the metal chair. You know in your mind that you will be successful in class with good attendance, paying attention, and taking good notes. Know that all your hard work in class and studying outside of class will help you do well in your classes. Let yourself feel the success, the joy, and the happiness. The better you can let yourself feel these sensations of confidence, the more you will feel like you will do great in school, no matter what class it is. Other people can see the confidence and positivity in you. Continue this image; as you breathe in, feel the confidence. Focus on your body: it's comfortable, relaxed and confident. Think about these sensations next time you walk into class and know hard work could pay off.

(Was everyone able to visualize this setting? Were you able to visualize the grade you wanted? Feel the confidence?)

Imagery task 3(social interaction):
Start with an image of walking into the pit. You have felt stressed and overwhelmed lately because of classes. You feel fatigued and tired and remember it is only Monday. See yourself walking toward your group of friends although you don't feel like talking. Feel your head hanging as you look down at your phone to avoid eye contact. Feel you're legs drag along the sidewalk and arms drooped by your side as walk. Feel the sunshine beating down on your skin on this hot afternoon. Feel the sweat slowly drip down your back. You try to remind yourself that it is just a class and there are so many bigger problems in life. You look up to see the trees full of beautiful green leaves. Smell the food in the cafeteria as the breeze blows (French fries, Asian, Alpine, subway). Suddenly you recognize how beautiful it is outside today. You look up to see you are about five feet from your friends. See the smiles on their faces increase as you walk their way. Hear them say "What's up man" and "Hey girl." Feel the easy movement of your special handshake or the grasp of a hug. Feel a smile come across your face and the tension slowly leave your body. Feel the stress disappear and a calm energy come across your body. You know in your mind that you will always have friends around to laugh and hang with to make you feel better. Hear the laughter you all make when someone cracks a lame joke. Let yourself feel better and become overcome with joy and happiness. Feel the bond your have with your friends. Others know you all will always have each other's back no matter what. Continue this image; as you breathe in, feel the happiness and excitement. Focus on your body: you feel relaxed, yet energized from seeing your friends. Think about the sensations when you are having a rough day. Know it will always get better and you have friends for support.

(How did everyone feel with this imagery task? Did you feel the negativity at the beginning of the imagery session and turn it into positivity as the session progressed? Remember you may not

always be having a good day when completing these sessions, but try to remain positive and happy and control your emotions.)

Adapted from: Nordin, S. M., & Cumming, J. (2005). More than meets the eye: Investigating imagery type, direction, and outcome. The Sport Psychologist, 19, 1-17.

Now that you have completed three practice imagery tasks, does anyone have any more questions about performing the imagery tasks on their own? Also, when performing these tasks, are you able to vividly imagine the situation and control the how the situation changes?

If you are having trouble with the vividness of the imagery task, there are a several ways to practice to improve this skill. For instance (past research) suggests starting with a simple imagery task, such as imagining the details of your dorm room or home. Try to imagine every detail, the colors, the smells, the texture, the size. Once you are able to visualize an object or location, imagine yourself performing a task in that place. For example, once you've imagined your dorm room, imagine yourself looking up music on your computer. Hear the sounds of you typing across the keys; hear the music, the beat. Feel the keys move under your fingers. Feel the comfort of the chair or bed underneath you.

If you having difficulty controlling the imagery task and manipulating the image, you may start with simple tasks and gradually increase the extensiveness of the image. Let's refer back to the example of you in your dorm room. If you are having trouble imagining you look up music on the computer, start simple. Begin by trying to imagine yourself sitting in your room. Once you are able to imagine yourself sitting then imagine yourself holding your computer. Again, feel the weight and texture of the computer. Once you are able to imagine holding the computer, imagine yourself typing. Gradually increase the activities you are completing until you feel comfortable imagining yourself looking up music on the computer. Therefore, starting simple and gradually increasing the complexness of the task as you are comfortable could help control your imagery.

Another suggestion when completing imagery sessions is to find a quiet and comfortable place to complete the task. If you are more relaxed and have fewer distractions, you could have an easier time completing the imagery task effectively so you may benefit from it.

Does anyone have any additional questions?

Experimental group:
Thank you for your participation. Throughout the next nine weeks, I would like you to complete three journal entries each week pertaining to your psychological health and well-being and daily 5 minute imagery tasks. These journal entries will involve some of these concepts over the

course of your season to help gain a better understanding of factors contributing to psychological health. You can complete these on your own time. You will receive these journal entries via email, therefore, it is important for you to check your email daily. You will have 48 hours to complete these journal entries. If you do not complete the journal entry in one sitting, you may go back and finish it later by clicking on the link provided in the email. Thus, it is important for you to NOT delete the email with the journal entry link until you have submitted it. We will also send you remainder texts to complete your journal entries.

For your imagery sessions, you should complete these daily in a quiet location. Do not complete these sessions during practice and/or class. If you have any questions about these journal entries or your imagery tasks, you may contact me via email at lmccarn@live.unc.edu. We will meet again during the 5th week and again at the end of the study in 9 weeks. Thank you again, and have a nice day!

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